Entomology

Newsletter 2019-2020

Department of Entomology
University of Illinois at Urbana-Champaign

(Illini widow skimmer, *Libellula luctuosa*, courtesy of Lee Solter)

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MESSAGE FROM THE HEAD

Although Oxford Dictionaries' Word of the Year for 2019 was "climate emergency," if entomologists could vote, the "word of the year" of 2019 would probably have been "insect apocalypse" (the observation that the planet's most adaptable multicellular organisms weren't coping well with its anthropogenic makeover). That said, actual extinctions were hard to demonstrate, but at least one report, Tripodi et al. (2019), documented the local extinction of *Perdita meconis*, an extreme specialist on poppies, including the endangered *Arctomecon humilis*, in the Mojave Desert. Ironically, *Perdita* means "lost." We "lost" some of our longtime faculty members, albeit to retirement, not extinction: Stewart Berlocher, and Bettina Francis retired from the department in December 2019 and January 2020 and Research Associate Sam Beshers retired in June 2020. In the spirit of dynamic equilibria, however, two new assistant professors joined the department in Fall 2019, coming here from their previous positions at, well, UIUC; Marianne Alleyne transitioned from Research Specialist to tenure-track Assistant Professor and Esther Ngumbi transitioned from Diversity Realized at Illinois by Visioning Excellence (DRIVE) Ethnic Studies postdoctoral associate to tenure-track Assistant Professor. To say they're both off to a good start is an understatement; after less than a year as an assistant professor, Marianne was elected Vice President-Elect of the Entomological Society of America (to serve as President starting in November 2022) and Esther published an op-ed in *Nature* and won a prestigious award from AAAS (that I can't name because it's still under embargo until February 2021). Not that our longer-time faculty have been slacking off—with respect to just on-campus achievements, over the past two years, Brian Allan was named University Scholar, Alex Harmon-Threatt was designated as a Romano Scholar, Andy Suarez was designated Elowe Professor of Integrative Biology (and his dracula ant *Mystrium camillae* set a new record for fastest animal movement of a resettable appendage ever recorded), and Gene Robinson, beyond multiple external awards (see below), was elevated to the position of Interim Dean of the College of Liberal Arts and Sciences. We also welcomed as a program affiliate INHS scientist Holly Tuten, who oversees the tick and tick-borne disease agent surveillance program for Illinois.

With respect to outreach, after ten years of operating entirely on altruism, the Pollinatarium celebrated its 10th anniversary with the news from Chancellor Robert Jones that his office will be providing an operating budget, for which we're profoundly grateful. Bees also inspired beverage giant AB InBev to connect their new sparkling honey-based beverage "B" altruistically with our bee research program, contributing $1 from every case sold to our Healthy Bee Fund. Test-marketing's on hold due to COVID-19, but by next year it might "B" available near you.

As for 2020, the Oxford Dictionaries Word of the Year for 2020 was "unprecedented," a choice with which I think no one would take issue. January and February were fairly routine, with an uneventful start to the semester and a well-attended Insect Fear Film Festival, our first dedicated entirely to crustaceans. Then, in March, COVID-19 hit Illinois, with the first case in Champaign County reported on March 8. I left my office in Morrill Hall on March 13 and I haven't been back in there since. For weeks, only essential employees (including Todd Fulton, our Insectary manager) were allowed in the building. The pace of research necessarily slowed, and the campus instituted a policy of granting automatic rollbacks for assistant professors on request and automatic one-semester extensions of Expected Graduation Date to graduate students. Teaching moved entirely online after spring break; if you bought Zoom stock in 2019 and hung onto it, lucky you…Some brilliant, resourceful, and altruistic UIUC scientists spend their time during lockdown developing a rapid, inexpensive saliva-based test and implemented a massive testing/contact tracing program that allowed us to open back up in August for a mix of online, hybrid, and face-to-face courses with regular testing according to risk (once a week for faculty and graduate students and twice a week for undergraduates, later increased to three times a week for fraternity brothers). After the first two weeks of Fall semester, UIUC had maintained a positivity level below 1%; by September 10, UIUC carried out 2% of all COVID-19 testing administered in the USA and by December 11, UIUC had carried out a million tests.

Faculty, students, and staff demonstrated remarkable resilience; between June 2019 and May 2020, the 10.25 line faculty collectively published more than 80 papers (give or take a few, depending on ultimate publication dates) and the graduate program faculty published on 10 orders of insects (or 9, depending on how biting, sucking, and bark lice are classified), along with a few ticks, mites, and crustaceans. In terms of service, six serve as editors or editorial board members of scientific journals. As for teaching, our portfolio expanded well beyond

entomology with Alex Harmon-Threatt developing and offering IB 110 Race and Environmental Biology, a course fulfilling the new campus general education requirement in minority cultures, Esther Ngumbi, who has a joint tenure-track appointment between Entomology and African American Studies, teaching Humanist Perspectives of the Afro-American Experience Race and Food Security, and Brian Allan offering a brand-new course on pandemics in Fall 2020 (a course that will now be offered on a continuing basis and not just in years when Earth is gripped by a global pandemic).

Speaking of pandemics, in case you're wondering how UIUC coped during the 1918-19 influenza pandemic, the University of Illinois remained open, as it has throughout the COVID-19 pandemic. Homecoming in 1918 was cancelled, but the game between UIUC and a group of Navy servicemen stationed at Municipal (later Navy) Pier in Chicago was played anyway, in front of empty stands. By spring 1919, as the epidemic waned, more than one-third of the 6600 students on campus had been infected and treated; 19 had died, a very low number compared to other campuses in the state, due to the extraordinary mobilization of campus medical personnel and the commitment of administrators to protect the students (https://storied.illinois.edu/1918-homecoming/). There were no degrees awarded to Entomology graduate students in 1918 or 1919 but in 1920, only three years after receiving his MS degree on "The anatomy of the head and mouth-parts of the generalized biting insects," Hachiro Yuasa received his PhD based on his dissertation, "A classification of the larvae of Tenthredinoidea." It looks like our department has a decent record of resilience during global pandemics, but I hope it's at least another century before we have to prove our mettle again!

FACULTY AWARDS AND RECOGNITION

External Recognition – 2019-2021

May Berenbaum – Honorary Member, Entomological Society of America (2020)
Alex Harmon-Threatt – Early Career Fellow of the Ecological Society of America (2019)
Gene Robinson – elected member, National Academy of Medicine; Wolf Prize in Agriculture (effective 2019)
Andy Suarez – Fellow, American Association for the Advancement of Science (2019)

Books Published – 2019-2021

Fred Delcomyn and James Ellis, 2021. *A Backyard Prairie*, SIU Press

James Ridsdill-Smith, Max Whitten, Phyllis Weintraub**,** and **May R. Berenbaum**, 2021. *An important and victorious science: past, present and future of the International Congresses of Entomology*. Washington (DC): Thomas Say

Robert J. Marquis, **Steven C. Passoa**, John T. Lill, **James B. Whitfield**, Josiane Le Corff, Rebecca E. Forkner, and Valerie A. Passoa, **2019**. *Illustrated Guide to the Immature Lepidoptera on Oaks in Missouri*. Forest Health Assessment and Applied Sciences Team FHAAST-2018-05 https://www.fs.fed.us/foresthealth/technology/pdfs/FHAAST-2018-05_Immature_Lepidoptera_Oaks.pdf

James B. Whitfield and A. H. Purcell. 2021 (in press). *Daly and Doyen's Introduction to Insect Biology and Diversity.* Fourth Edition. Oxford University Press. 734 pp.

ALUMNI AWARDS AND RECOGNITION

In the past two years, three UIUC alumni were elected as Fellows of the Entomological Society of America—Christina Grozinger, a Distinguished Professor in the Department of Entomology at Penn State (and former postdoctoral student with Gene Robinson), Bruce McPheron, executive vice president and provost of The Ohio State University since 2016 (and two-degree alumnus working with Stewart Berlocher), and Gene Kritsky, Professor of Biology and Dean of the School of Behavioral and Natural Sciences at Mount St. Joseph University (who revised the Enicocephalidae of the Western Hemisphere under the supervision of Lewis Stannard Jr.).

STUDENT NEWS

List of Outstanding Teachers in Entomology Department at UIUC
(*faculty underlined; * - The instructor ratings were outstanding.*)

Spring 2019
Rafael Achury Morales, Brian Allan* (361), Nicholas Anderson, Nathalie Baena Bejarano, May Berenbaum* (435), Daniel Bush, Sydney Cameron (492), Charles Dean*, Adam Dolezal (432), Corbyn Giers, Edward Hsieh, Daniel Pearlstein, Andy Suarez* (329)

Fall 2019
Brian Allan* (546), Nicholas Anderson*, Carla Cáceres* (362), J. Matthew Flenniken, Larry Hanks (482), Brendan Morris*, Eric South, Andy Suarez (203), Jonathan Tetlie*, James Whitfield* (468)

Spring 2020
Brian Allan* (361), Carla Cáceres (150), Charles Dean, Adam Dolezal* (432), J. Matthew Flenniken, Brendan Morris, Andy Suarez* (329)

Fall 2020
Brian Allan (299), May Berenbaum (444), Carla Cáceres (362), Kat Coburn, Charles Dean, Anna Grommes, Larry Hanks (401), Alexandra Harmon-Threatt (110), Edward Hsieh, William Montag, Brendan Morris, Kylee Noel, Rachel Skinner, Lincoln Taylor, Annaliese Wargin, James Whitfield (467)

Campus Awards
Undergraduate Entomology Research Award – Justin Falk (2019); Tyler Blackwell and Anna Grommes (2020)
Ellis MacLeod/DuPont Award for Outstanding Teaching – Nicholas Anderson (2019); Brendan Morris (2020)
Sharon Gray Memorial Award (Teaching/Mentoring) – Nicholas Anderson and Anna Grommes (2019)
Herbert Holdsworth Ross Memorial Award – Eric South, and Jared Thomas (2019); Brendan Morris (2020)
Lebus Graduate Scholar Award – Joshua Gibson (2019), Charles Dean (2020)
Harley J. Van Cleave Research Award – Nicholas Anderson and Jonathan Tetlie (2019); Jonathan Tetlie (2020)
Francis M. & Harlie M. Clark Summer Fellowship – Rachel Skinner (2019); Nicholas Anderson (2020)
Francis M. & Harlie M. Clark Research Support Grants – J. Matthew Flenniken and Rachel Skinner (2020)
U.S. Dept. of Education's Graduate Assistance in Areas of National Need (GAANN) fellows – Nicholas Anderson, Scott Clem, Joshua Gibson, Tanya Josek, and Jacob Torres (2018-2019); Jacob Torres (2019-2020)
Entomology Spring Award – Nicholas Anderson (2020)
Fred H. Schmidt Summer Scholars Award – Nathalie Baena Bejarano and Elijah Juma (2019); Elizabeth Bello (2020)
Entomology Summer Stipend Award – Charles Dean, Kristen Reiter, and Eric South (2019); J. Matthew Flenniken, Teresia Njoroge, Rachel Skinner, and Eric South (2020)
Summer Supplemental Block Grant – Elizabeth Bello, J. Matthew Flenniken, Edward Hsieh, William Montag, Rachel Skinner, and Katherine Coburn (2020)
Graduate College Conference Travel Award – Elijah Juma, Teresia Njoroge and Jonathan Tetlie (2019); Nicholas Anderson and Joshua Gibson (2020)
Graduate College Dissertation Travel Grant – Daniel Swanson (2019)
Graduate College Master's Project Travel Grant – Elizabeth Bello and J. Matthew Flenniken (2020)
Graduate College Dissertation Completion Fellowship – Nicholas Anderson (2020)
Illinois Distinguished Fellowship – Luke Hearon (2020)

National/International Awards for Students
2019 USDA NIFA AFRI Education and Workforce Development (EWD) Predoctoral Fellowship: Scott Clem

Ellis MacLeod/DuPont Award for outstanding teaching in the Department of Entomology

Ellis G. MacLeod, 1923-1997

Ellis G. MacLeod joined the faculty in the Department of Entomology at the University of Illinois at Urbana-Champaign, in 1966, after completing his dissertation research and postdoctoral position at Harvard University. Although his own research interests were focused primarily on systematics and evolution of species in the order Neuroptera, his knowledge of Class Insecta was famously encyclopedic. His greatest contribution to the discipline of entomology was his exemplary teaching, particularly in the core course, required of all graduate students, in insect systematics. In recognition of his classroom teaching, he received the William F. Prokasy Award for Excellence in Undergraduate Teaching in the College of Liberal Arts and Sciences in 1989; his influence, however, exceeded the boundaries of the classroom and he was extraordinarily generous in sharing his wealth of knowledge with anyone who sought him out. The Department accordingly named its award for outstanding teaching by an entomology graduate student in his honor.

Nick Anderson

Nick is a current Ph.D. student in the Department of Entomology. He has served as a TA for five different courses (IB 104, 150, 202, 203, and 361) and has been listed on the teachers ranked as Excellent by their students in five different semesters. Nick has exceptional performance as the head lecture and merit TA for IB 203 in fall 2018, and as the lecture TA for IB 361 in spring 2019. In addition to grading lecture activities and handling student questions for lecture, Nick generated new study materials for merit section including practice exams, new questions, and activities. Beyond his classroom achievements, he has mentored undergraduates in independent research and seven high school students through the Illinois P-20 Council's Mentor Matching Engine.

Herbert Holdsworth Ross Memorial Award

Herbert H. Ross, BS University of British Columbia 1927, MS and PhD UIUC 1929 and 1933. He married Jean Alexander in 1932, and she assisted him throughout his life with his research. Ross was at the Natural History Survey from 1931 until he retired in 1969. He was a brilliant systematist who generously shared his passion and wisdom with generations of students. Funding for this award is possible due to the generous donation of Dr. Charles Alexander Ross and his wife Dr. June Ross, son and daughter-in-law of Herbert and Jean Ross.

Milton Tan

Preliminary assessment of ddRADseq for comparative biogeography in North American Minnows

Bradley Scott

Differences in Locomotion and Habitat use across the Agnathan/Gnathostome Transition

Eric South

Molecular phylogeny of North America stoneflies

Jared Thomas

Understanding the paleobiota of the Late Oligocene Renova Formation of Montana

Fred H. Schmidt Summer Scholars

Fred as a Student 1957 — Fred at Retirement 2012

The Fred H. Schmidt summer award, endowed by his niece and nephew Margaret and Ed Larsen, commemorates alumnus Fred H. Schmidt, who received a BS degree in 1957 and a master's degree in entomology here in 1959 and spent many years at the USDA Forest Service Laboratory in Corvallis, OR. In accordance with his wishes, the Schmidt Summer Award is used to support recruitment and retention of students during the summer months.

Entomology Summer Stipend Award

Photo: Buffalo Treehopper with Mohawk by Elizabeth Dabek

The Entomology Summer Stipend Award provides summer support for graduate students in Entomology to enable them to continue to make progress in their thesis research.

Nathalie Baena Bejarano and Elijah Juma

Nathalie is advised by Dr. Sam Heads. Her research focuses on taxonomy & systematics of extant and extinct Tridactyloidea. She will use this award to study two new specimens of Tridactyloidea from Burmese amber that were donated recently to INHS, as well as to study the phylogenetic relationships of species of Tridactyloidea

Elijah is advised by Dr. Juma Muturi and Dr. Brian Allan. He will be collecting eggs of the mosquito *Aedes albopictus* in Champaign County, IL, between July and September in order to characterize changes in its midgut microbiota in response to exposure to two distantly related arboviruses: La Crosse virus (LACV) (*Bunyaviridae: Orthobunyavirus)*, and dengue virus serotype 4 (DENV-4) (*Flaviviridae: Flavivirus)*.

Charles Dean, Kristen Reiter, and Eric South

Charles is advised by Dr. May Berenbaum. His research is on coevolutionary between the invasive interactionsparsnip webworm (*Depressaria pastinacella*) and purple carrot-seed moth (*Depressaria depressana*) and their native and invasive apiaceous hostplants

Kristen is advised by Dr. Marianne Alleyne. Kristin's research involves determining the adaptive value of diffraction grating-induced iridescence in burrowing beetles.

Eric is advised by Dr. Ed DeWalt. The primary objective of Eric's research is to develop a robust molecular phylogeny of North American Plecoptera. Eric will use this award to obtain and process shipments of live adult June-emerging perlodid stoneflies collected by stonefly researches in the Sierra Nevada, California.

POLLINATARIUM NEWS

(by Lesley Deem)

In January 2019, the year started off with the local beekeeping club, CEIBA (Central Eastern Illinois Beekeepers Association) presenting a class for beginning beekeepers and as vice president of the club it was my pleasure to present some of the classes.

As spring started in March, I did presentations to groups such as the Champaign County Audubon on native bees and pollinators and the importance of habitat building, the Champaign Lions Club and The Caring Place of Urbana. Ali, Dr. Robinson's beekeeper, brought bees for the observation hive in April and we started our school tours with bee viewing. As usual the Orchard Downs Preschool groups came to see the bees, taste some honey and helped plant flowers in the bee sculpture bed. Our spring wouldn't be complete without the Environmental Biology classes from Parkland coming for coffee (tea) and conversation.

I started the summer off by attending the North American Prairie Conference gathering information about prairie conservation and habitat building. I loved gathering practical information to share with all of our visitors. Our walk in hours on Saturdays brought a wide range of visitors. Parents and grandparents brought children of all ages. During National Pollinator week in June we again hosted the Girls Explore Biology (Grades 3rd to 6th) from the Champaign Park District. At the end of Pollinator week we held the annual Bee Blitz at Meadowbrook Park and the Pollinatarium. The following week we sponsored our fourth Illini 4H Academy about honey bee biology and beekeeping. In July we hosted parents, grandparents and kids for the college of ACES Family Summer Academies about honey bees and native bees' homes. This was followed by Cub Scout pack visits and Pollen Power camp. Other visiting groups included the Rock Springs Conservation campers, Agricultural Communications Research Apprentice program, and UIUC Research apprentice program. August finished off with a booth at the Urbana Sweet Corn festival with other members of the Champaign County Museums Network and the start of school and school group visits.

Our school visits for the year included classes from: home school parents and groups, Champaign Unit 4 schools, Urbana Schools, Next Generation School, Montessori schools, Parkland classes, and University of Illinois classes. We are continuing to work with the students from Bee Campus to increase habitat for bees on the UIUC campus.

Although 2020 began much as 2019 did, with CEIBA presenting a class for beginning beekeepers, by March, when the campus shut down for COVID 19, face-to-face activities stopped for the Pollinatarium for the rest of the year. The COVID 19 shut down has made me realize even more what a hands-on program we have at the Pollinatarium and how thankful we are for the volunteers from the Entomology graduate students, the Master Naturalists, and Master Gardeners and visitors. I look forward to when we can all visit with the bees at Pollinatarium again.

Thank you to Dr. Berenbaum and all our supporters.

EXPANDING ENTOMOLOGY EDUCATION AND OUTREACH

Written by Erinn R. Dady
Undergraduate in Earth, Society, & Environmental Sustainability
Student Researcher in the Ngumbi Lab | Department of Entomology


Esther Ngumbi

This past summer, I was fortunate to be selected as a 2020 Community-Academic Scholar for Solving Poverty at the University of Illinois. The Community-Academic Scholars program is a collaboration between the university and a local community partner. The program works to directly benefit the community members served by the partner organization. I worked under the mentors Dr. Kevin Tan, in the Department of Social Work, and Dr. Esther Ngumbi, in the Departments of Entomology and African American Studies. Our community partner was DREAAM House, a local college & career readiness program working with and empowering Black youth.

2020 has been a year of reckoning with many of the injustices faced by communities of color for far too long. Systemic racism prevents access to education and employment, perpetuating an intergenerational cycle of poverty. Education is a public good and a critical piece of our democracy that can provide tools to explore the world. Setting young people up for success in school creates a clear pathway to earn a high school diploma and prepares students for postsecondary training and education.

Fortunately, our community has DREAAM House. They are here to fill in some of the gaps in public education. DREAAM House is a local college & career readiness program that works with predominantly Black youth ages 3-24, to empower them to build a successful life. DREAAM sees great potential in these young men and makes space for them to have transformative experiences that provide long-lasting benefits. DREAAM plants seeds of hope for the future and helps to shape tomorrow's community leaders.

Dr. Esther Ngumbi put together an incredible insect-themed program for the DREAAM visits to Fowler Farm. They visited several times, and we discussed the importance of studying insects, and how entomologists can help farmers to fight agricultural pests. Esther brought caterpillars and mounted collections to share with students and demonstrated how to use a net to catch insects. Everyone had their own net and caught a variety of insects; it was a very fun activity for all of us. We identified insects together and discussed how scientists classify and categorize things to study them. We also set up pitfall traps near the vegetable fields, to identify potential pest activity. The following week, we taught some simple identification rules, and sorted everyone's catch. We once again identified insects together and the students surprised us with how competitive they were over who caught the most insects.

Overall, it was a very rewarding experience, and I feel very fortunate to have helped to build some fun summer memories during this difficult time. DREAAM House is an awesome organization and I look forward to future insect programming with them. Esther is incredible, and anyone lucky enough to hear her speak will hear her tell how incredible science is! I am so excited for all the future endeavors in her lab!

FACULTY

Brian Allan. Since the last newsletter a new cohort of graduate students have joined the lab, including Matt Flenniken in Entomology and Sulagna Chakraborty and Derek McFarland in PEEC. Lab alumni continue to do great things. Allison Gardner and Allison Parker are thriving as Assistant Professors at the University of Maine and Northern Kentucky University, respectively. Erin Allmann Updyke and Erin Welsh are the creators and hosts of the wildly popular "This Podcast Will Kill You", which has done amazing work at unpacking the many facets of the COVID-19 pandemic for the general public. Tyler Hedlund continues to do important work in his role with the USDA APHIS' Plant Protection and Quarantine program, while Elijah Juma has completed his Ph.D. and is a Program Manager for the Pan-African Mosquito Control Association. Lab manager Page Fredericks is wrapping up the long-term lab research funded by the Strategic Environmental Research and Development Program. Brian is taking a sabbatical in Spring 2021 and is excited for the opportunity to finish old projects and contemplate new directions in research.

Marianne Alleyne. The past few years my activities, and those of my lab, have continued to diversify. As a result, I interviewed for, was offered, and accepted a tenure-track position in the Department. I am so honored to have the support of my wonderful colleagues and to be part of this Department as an assistant professor. I now officially head the Alleyne Bioinspiration Collaborative (ABCLab). We study bioinspired design of multi-functional materials and the biomechanics involving cicadas, dragonflies, flies, click beetles, and leafhoppers, focusing on wettability, antimicrobial properties, friction characteristics, reflectivity and iridescence.

Marianne Alleyne and Lee Solter

The big professional news is that I was elected to join the presidential line of the Entomological Society of America. I will serve as president the year prior to the 2023 Annual Meeting. We have many challenges ahead of us (diversity, equity and inclusion; financial consequences of the pandemic and a changing publications landscape; status of science in our daily lives and in making policy), but I am excited to be able to help lead a Society of which I am incredibly proud.

I am still involved in online education. I am most proud of the online Masters of Science Teaching of Biology program for which I am the Graduate Director, and a popular course on Bioinspiration (= using biology as inspiration for new technological innovations). I still teach the core Insect Physiology course, which is my favorite course to teach. Another fun course I have developed with a colleague in MechSE is the Bioinspired Design course that teams up engineering and biology undergrads and encourages them to design bioinspired products, even prototype those ideas.

In summer 2019, Kristen Reiter graduated with her masters and accepted a position as an Adjunct Instructor at Stark State College in Ohio, and Tanya Josek graduated with her doctorate and took a position as a Postdoctoral Researcher at Illinois State University. This summer 2020, Lizzie Bello joined my lab as a master's student. This leafhopperpride picture is by Lizzie.

On the personal front not much has changed, except that Andrew is traveling far less due to the pandemic, which is one of the few benefits of lockdown. Harmen is now an Integrative Biology major at Illinois with a penchant for herps, not insects, and high-school junior Willem is keeping us entertained with his optimism and gregariousness even in these COVID times.

Please feel free to engage with me on Twitter @Cotesia1 #EntVocate.

May Berenbaum. Every year, the Senckenberg German Entomological Institute in Müncheberg selects an "Insect of the Year," to raise awareness about insect conservation, and in 2019 their choice was Europe's rust-red mason bee *Osmia bicornis*. It was an apt choice, given how much attention bees in general received throughout 2019. On January 3, 2019, e.g., the webseries ApocalypseNow debuted its episode on the coming bee-pocalypse (https://bit.ly/3baxEzx), featuring interviews with (among others) Alex Harmon-Threatt and me; since then it has been viewed more than a million times! Other bee-related interviews didn't have quite the reach but made up for smaller audiences with diversity, ranging from the Womens' Business Council of Champaign (in a room in Champaign's Amtrak station) to the North American Pollinator Protection Campaign (in the Department of the Interior building in Washington, DC). Beyond the bee-pocalypse, the Insect Apocalypse more generally was a concern, manifested in 2019 by a symposium at the Entomological Society of America annual meeting in St. Louis (to be published as a collection in PNAS, including one written with Scott Althaus, of UIUC's Cline Center for Advanced Social Research, reporting our study analyzing 10 million news stories on pollinator decline published between 2007 and 2019). Speaking of news stories, in April 2019 I was actually asked by Smithsonianmag.com, "If Thanos actually wiped out half of all insect life, how would Earth fare?"

In November 2019, the folks in Senckenberg named the European blister beetle *Meloe proscarabaeus* as the Insect of the Year for 2020—a metaphorical harbinger of things to come, given that adults produce secretions so toxic that eating one could kill you and that larvae latch onto female bees, ride back to their nests, and proceed to eat their way through the bee grubs inside. The year began unremarkably; in January I attended the HoneyLove Natural Beekeeping Conference in Los Angeles (with a side trip to visit Hannah) and in February visited Duquesne in Pittsburgh for a Darwin Day lecture, at the invitation of alumnus David Lampe. IFFF37 also went off without a hitch. Then came COVID-19; after spring break, all instruction went online and the campus went on lockdown. Teaching a course in Critical Evaluation of Herbal Remedies was timely in that rapid syllabus changes provided students with a real-time opportunity to discuss dubious COVID-19 remedies as they rolled out, including hydroxychloroquine, cow urine, artemisia, colloidal silver, and bleach, among others. I never did return to my office, but I attended a wild diversity of virtual events, including Texas A&M Aggie Women in Entomology's Fall seminar, the Congreso of the Sociedad Colombiana de Entomologia, the North Carolina Entomological Society of America's annual meeting, a Science Speed Dating session on evolution for the National Academy's Science and Entertainment Exchange, Yale Class of 1975's Bugsonance, featuring a conversation on bugs in films with me and Bob Picardo (best known as the holographic doctor on Star Trek: Voyager, the annual IgNobel ceremony, and our Illinois mixer at the annual Entomological Society of America meeting (complete with an Arthropocalypse pop quiz). As befit 2020, murder hornets replaced bees in requests for media interviews. In May, e.g., Erin Caldwalader from ESA's policy office asked if I'd be willing to testify (virtually) at a House Committee on Natural Resources hearing on HR 6761, the Murder Hornet Eradication Act, authorizing $4 million to assist states in eliminating Asian giant hornets, but ultimately I wasn't called and the committee passed the bill without any advice from me.

Although research slowed down in 2020, my students and collaborators were so brave and resourceful in dealing with pandemic challenges. Charles Dean managed to collect the newly invasive *Depressaria depressana* along a northward transect up until he had to stop at the Canadian border; Daniel Bush arranged an in-person USDA-APHIS inspection so that our permit for rearing navel orangeworms could be renewed; Ed Hsieh, Will Montag, and Teresia Njoroge all defended theses virtually; Bernarda Calla partnered with me for an *Annual Review of Entomology* review of honey phytochemistry, a USDA grant on beebread (funded) and an edited collection on cytochrome P450s for *Current Opinion in Insect Science*; and Ling-Hsiu Liao and Wen Yen Wu fought bureaucracies in the USA and Taiwan in order to return to Illinois and resume their studies of honey bees (with Wen-Yen beginning his doctoral studies in Fall 2020). For me, much of 2019-20 was taken up with service as Editor-in-Chief of PNAS, a journal that saw its average 20,000 submissions per year balloon to 24,000 in 2020, reflecting both COVID-19 urgency and lockdown time for manuscript preparation by scientists around the world.

If you're wondering how the pandemic has affected stand-up comedy ventriloquists, Hannah's comedy club gigs pretty much disappeared, but an amazing opportunity arose in May, when Hannah was invited to stream for LIVIT, an Asian streaming service for entertainers that was expanding its operations in the USA. You can follow her stream (with comedy partner and disgruntled unicorn Marzipan Lavendar Sparkles) at https://17.live/profile/r/8711928.

Sydney Cameron. I wondered whether I could get through a summary of my lab's research over the last couple of years without mentioning COVID-19, but it was impossible unless I ignored our lost summer of fieldwork in 2020. This set us back, but we hope to make it up in 2021. In collaboration with Ben Sadd and his students at Illinois State University, we continue to examine causal factors of bumble bee decline in North America, targeting functional genomic effects of *Nosema bombi*, a bumble bee pathogen thought to have played a significant role in the rapid and widespread population losses of certain species. We are also looking at the potential role that pesticides, particularly the neonicotinoid imidacloprid, may be Kayaking in Blue Hill, ME playing in declining bumble bee health. In spite of COVID restrictions, my postdoc, Rubén Blázquez, has been able to continue lab work.

Kayaking in Blue Hill, ME
July 2020

Ruben sightseeing in Chicago

You can read about the details of our research in Rubén's blurb in this Newsletter. This year we also published a review on global trends in bumble bee health in *Annual Review of Entomology*.

Jim and I are in our fourth year as co-Editors in Chief of *Insect Systematics and Diversity*, which continues to grow in size and should receive its first impact factor in the coming year 2021. See the latest papers at https://academic.oup.com/isd.

SAC and JBW at RBG memorial in Washington. DC 2020

Adam Dolezal. Our work continues to focus on studying how different environmental stimuli affect bee behavior, physiology and overall health, with our two major areas focusing on 1) bees in Midwestern ag systems and 2) how virus infection interacts with other stimuli to affect bee behavior and physiology. In 2019-20, we published 12 articles on this work, including two in the *Proceedings of the National Academy of Sciences*, one on each of the main research themes.

Other big highlights have been seeing the lab grow, adding two postdocs, Dr. Gyan Harwood (co-author the PNAS paper looking at virus effects on bee behavior) and Dr. Ashley St. Clair (co-author on the other PNAS paper studying bees in ag landscapes), as well as the addition of graduate student Lincoln Taylor. Unfortunately, Jake Torres, a PhD student in the lab had to take leave of the program, and we miss him dearly. In 2020, we celebrated the masters defense of founding lab member Edward Hsieh; he's already published this work and will be staying on for a PhD in the program. He even won an award for his presentation the 2020 Entomology annual meeting.

Since the last newsletter, my lab has been also fortunate enough to receive funding from several sources to continue our work, including multiple grants from USDA-NIFA to study honey bee pests and pathogens, and funding to collaborate with the Illinois State Dept. of Agriculture in a statewide data collection and monitoring program on honey bee pest prevalence. In 2020, we were excited to participate in the founding of the NSF-funded Biological Integration Institute organized through the Institute of Genomic Biology; the "Genomics and Eco-evolution of Multi-scale Symbioses" (GEMS) institute, a collaboration between UIUC, U Indiana, and U Chicago, that seeks to integrate understanding of symbioses through an interdisciplinary focus on the bee-clover interactions and the many levels of organization that go into this system.

On the personal front, as of writing this, we've all been lucky enough to stay in good health so far and I'm fortunate that I mostly like to stay at home anyway. My wife Kelly had been a remote worker even pre-COVID, so her work has been less disturbed than many. Our daughter Helen is now 5 ½, starting kindergarten under less-than normal conditions. With almost no prodding, she also started her own insect collection, which has been a lot of fun. Our son Fred is now 2 ½ and remains a happy and fun little person to have to be quarantined with.

Larry Hanks. As you can see from the picture, I haven't changed a bit in the last two years. I continue to thrive, despite COVID-19, and at the time of this writing am almost done remote teaching my Intro to Ento course. I have never seen the students, but assume they are out there and riveted by my narrated Powerpoints. Thanks to the pandemic, Rebecca was forced to cut short an internship in Uganda back in early spring. She's living at home, which is nice, and is working remotely for AmeriCorps, which is kinda like the Peace Corps. Jean also is working remotely for the office of the Dean of Engineering, so sometimes we all three are on our laptops at the dinner table, with occasional breaks to walk around the neighborhood. Meanwhile, Mason is living with some friends in an apartment on Lincoln Ave, just off campus. He's taking a gap year while contemplating how to go about pursuing his interest in music production. Waiting for the vaccine and a return to normal life. I'll retire at some point in the not-too-distant future. There, I said it.

Masked Summer Sampling 2020

SIB Awards Ceremony 2019

Alex Harmon-Threatt. The HT lab has never been better than in 2019 and 2020, though the lockdown has slowed us a bit. Overall, we've hit a real stride with work, continued to grow our numbers, and increased our outreach. During this time, we had a lot of new people join us. including 2 postdocs (Karl Roeder and Ryan Leonard), 2 lab techs (Morgan Mackert and Josh Villazana), 2.5 grad students (Kat Coburn, Marissa Chase, and Annaliese Wargin), and 3 undergrads (Gabriel Harmon, Charlie Tang, Justine MacAlindong). Combined with the current students (Nick Anderson, Jon Tetlie, Scott Clem, and Ben Chiavini (undergrad)), that brings the lab group to about 12. Alex heads a collaborative outreach project called I-Pollinate that brings together several researchers to study pollinators across Illinois with the help of community scientists. We've been fortunate to continue to be awarded many grants and awards as well. Here are some notable grants: Nick Anderson- Dissertation Completion Fellowship, Scott Clem- USDA Predoctoral Fellowship, Marissa Chase- North Central Branch SARE, Alex and I-Pollinate team- CORE funding, and Karl Roeder- Campus Research Board Award. Alex was also recently recognized as an Early Career Fellow of the Ecological Society of America and as a Romano Professorial Scholar in LAS. The students have won too many awards to count, including the Sharon Gray Memorial Award (Anderson and Grommes), Oral Presentation Awards at EntSoc (Clem), Undergraduate Research Fellowships (Chiavini, MacAlindong, Harmon), teaching Awards (Tetlie and Anderson), and many others. Last but certainly not least, some prominent papers were published in *Annual Review of Entomology*, *Scientific Reports*, *PlosOne*, and *Journal of Applied Ecology*, among many others. The grad students also organized a symposium at Entsoc 2019 that was incredibly well received. Through it all we try to make sure we are having fun along the way with canoeing trips, game nights, dinners, pumpkin carving, and other fun activities.

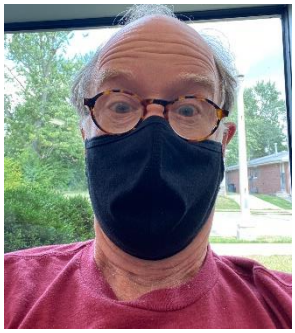
Esther Ngumbi. 2020 was a difficult year. However, despite the challenges, the Ngumbi lab undertook two BIG experiments and participated in several workshops during the summer. At one point during the year, we had over 400 plants growing. I look forward to publishing the research findings we obtained. We enjoyed every moment during these experiments. We particularly loved planting and experiment take-down days. With so many plants, we had to have root-washing parties. Moreover, Erinn Dady and I enjoyed working with young students at Fowler Farm/Hendricks Farm during the summer and early fall. During these workshops we collected and identified insects. Seeing the students appreciate Entomology was gratifying.

I also continued writing opinion pieces, beginning with the first one of the 2020 year that was carried by WIRED. This piece opened many other opportunities including being invited by University of Cape Town Vice Chancellor to participate in a panel, and an invitation to participate in Berlin Science week presentations. I think this year, I also pushed the number of talks I can give at any given year. At the moment, that number is ten. I particularly enjoyed giving invited talks at several universities, including Cornell and Penn State.

As 2021 fast approaches, I look forward to pushing in every front—research, teaching and public engagement. Importantly, I look forward to teaching Science Communication and Race and Food Security class.

Gene Robinson. It's a pleasure to greet all our alumni; I hope you are safe and healthy. I'm doing something new this year! I've stepped away from being director of the Carl R. Woese Institute for Genomic Biology (IGB) and am serving as the interim Dean of the College of Liberal Arts & Sciences (LAS). As an Entomology professor, I've been in LAS for 31 years; when the former dean departed on short notice and I was asked by the Provost to serve for a year while a national search is conducted, I said yes. I am privileged to work with a talented and dedicated group of associate deans, and together we are working hard to navigate the challenges of facilitating undergraduate and graduate education during the COVID-19 pandemic. We also are putting special emphasis on new programs and initiatives to improve diversity, equity, and inclusion across all areas of LAS, including STEM. As many of you know, faculty in the Department of Entomology have an illustrious history of serving campus in various leadership capacities, and I am proud to continue this tradition.

Andy Suarez. Is it possible to discuss this past year without mentioning COVID-19? Apparently not! The biggest impact the pandemic has had on the lab is the lack of travel to collect ants. Subsequently, we have not been able to start new projects. However, we are relatively lucky with lab members having plenty of existing data to analyze and write up. We are definitely all looking forward to getting back in the field as soon as it safe to do so. Despite the Zoom burnout coupled with the isolation of working from home, there has been some exciting news this past year. Marianne Alleyne and I were awarded an NSF grant (with Will Barley in Communication and Aimy Wissa in Engineering) to create new courses and methods for interdisciplinary research with the eventual goal of starting a Center for Bioinspired Design on campus. Mark Hauber and I co-edited (with his student Hannah Scharf and Kern Reeve from Cornell) a special issue of *Philosophical Transactions of the Royal Society of London* on recognition systems. The lab also published a few articles on the biomechanics of movement in ants, including how they stay balanced while walking and jumping (yes, there are ants that jump). Finally, I am very honored to have been named the *Jeffrey S. Elowe Professor of Integrative Biology*. While the pandemic has prevented us from having an investiture this year, I look forward to meeting Jeffrey and celebrating this recognition next year, or as soon as it is safe to do so.



Speak no evil!

Jim Whitfield. My lab has been winding down some in terms of graduate students and grant funding, in preparation for official retirement at the end of 2021. But the action has not stopped! 2019-2020 saw a delightful 6-month exchange visit from Brazilian Ph.D. student Julia Gibertoni (paper near submission), undergrad Lizzy Dabek finishing and then publishing her project from my lab (she's now finishing her MS at the University of Maryland), undergrad Tyler Blackwell finishing a project in my lab (paper being finished now; Tyler himself is in grad school at the University of Washington), and undergrad Dillon Max starting in the lab during COVID but has a collaborative project already pretty far along. Former grad student Diana Arias-Penna (now teaching at Rosario University, Colombia) published a magnificent 685-page monograph from her thesis which described 136 new species of *Glyptapanteles*, many of them named for people in our department! Recent grad Kyle Parks has been publishing his thesis chapters while teaching at the University of Pittsburgh. My 2017 and 2018 collaborations on polydnaviruses in France are leading to final results now (one published in 2019 and the other due out in December 2020), and I continue to enjoy collaborating with students and faculty at other institutions (including Bob Marquis at the University of Missouri-St. Louis, Diego Campos at ECOSUR on the Yucatan Peninsula, and Dan Janzen and Winnie Hallwachs at University of Pennsylvania and in Costa Rica).

Tyler Blackwell & Julia Gibertoni in the lab

Dillon Max in the lab

The COVID disruptions have forced more focus on writing and editing than on getting new research done. Fortunately, there was (and is) still a lot to catch up on! A coauthored illustrated field guidebook to caterpillars on oaks came out (25 years late!) in 2019, and in Fall 2020 I am finishing proofreading the 4th edition of *Introduction to Insect Biology and Diversity*. Sydney and I are enjoying our co-editorship of ESA's new journal *Insect Systematics and Diversity* and are grateful to be staying healthy and active!

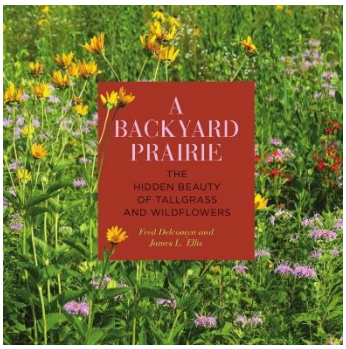
With collaborators Diego Campos, Dan Janzen and Winnie Hallwachs at ESA 2019

EMERITUS FACULTY

Fred Delcomyn. I'm sure you will get plenty of news from others about the effects of COVID-19 on their research and their lives. I can say something about that as well, but the fact of the matter is that Nancy and I have been incredibly fortunate in that we are both retired and we have five acres of woodland and prairie to play around in. No going stir-crazy for us, at least not in the way that others have to deal with that problem.

I did give a (virtual) presentation to students at Parkland College in their Armchair Traveler series. A different experience, for sure. Zero student participation, which was not terribly surprising but nevertheless disappointing.

In other news, we have added another granddaughter to the mix, Vivienne Delcomyn, born at the beginning of this year (2020). That makes eight grandchildren in total; from all reports Vivienne will likely be the last one. Eight is certainly enough to keep up with. Current ages range from 10 months to 14 years.

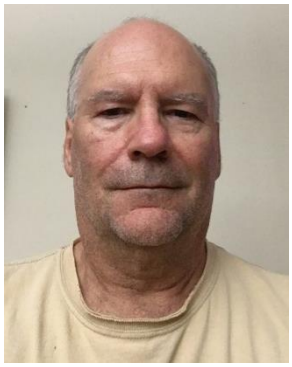


The other news is in a way still pending. The book I wrote with James Ellis, *A Backyard Prairie*, was accepted by Southern Illinois University Press early this year. We have finalized the illustrations (mainly my photographs) and the text. Next up is the layout design. Publication date is tentatively set for July, 2021. Look for it in a bookstore near you (or online) if you have any interest in nature photography or tallgrass prairie. Here's an image of the cover.

Bettina Francis. I retired at the end of January 2020, and the COVID-19 shutdown began in mid-March. Life will resume once enough of us are vaccinated.

Hugh Robertson. I retired at the end of 2018 and redirected my efforts to a lifelong goal of going ocean sailing. I spent most of the spring in California looking for a suitable sailboat and enjoying the amazing wildflowers, the summer in South Africa helping care for my 95-year-old mother who died in July, and then the fall in Oregon and Washington looking at more boats. I eventually settled on a 30-year-old Pacific Seacraft Crealock 34 advertised in Panama on the Caribbean side. Christina and I flew down to spend a week in Panama including inspecting it in September, I bought it in October, then flew back down and spent two weeks working on it and getting it back into the water in November, whereupon Christina and I had a week doing a shakedown cruise in the nearby spectacular San Blas islands (picture). We already had plans to go to South Africa with friends so I spent the winter there kiting. We returned as the coronavirus was spreading, but with optimism my daughter Erica joined me heading back to Panama in March for her final Spring Break at George Washington University, however the country started shutting as we arrived, and we had to bail three days later. I returned to our lockdown but managed to get five kitesurfing trips in to Cape Hatteras this year, before finally succumbing to a sore right shoulder that turned out to be a badly torn rotator cuff. Surgery was in early October and I am rehabbing through the end of January, when I hope to return to my sailboat in Panama, probably to sail in the Caribbean for a year before hopefully transiting the canal in early 2022. At home Christina continues her artwork in her studio in downtown Champaign along with several garden projects for others, Gabriel is making a go of living in Seattle with his girlfriend, and Erica has taken a gap year and spent most of it travelling around the west in a 2007 Toyota RAV4 converted into a micro-RV, rock-climbing with friends based in Jackson, Wyoming. It seems likely both of our children are headed west for the long haul.

AFFILIATES AND ASSOCIATES



Sam Beshers. I decided, on fairly short notice but before the pandemic hit, to retire at the end of June 2020, and the main impetus was to have time and mental space to focus on ant research and writing. My plan was also to remain actively involved with Entomology, but that's a little challenging since the third floor of Morrill is dark and empty most of the time. Nevertheless, I show up when I can.

The ideal plan was to spend four hours a day on research and writing, and four hours learning to play jazz guitar. The reality has involved a large number of house projects, hauling and spreading a half-ton of mulch, digging the garden beds, and other delights, but with the landscape bedded down for the winter I'm working to get those hours back where they should be. I expect to be fairly proficient at the guitar when I reach 120 or so.

As ever, my main research concern is The Field Formerly Known As Division Of Labor (TFFKADOL) as revealed by simulations, theory and the behavior of actual ants and other social insects, and progress is happening. I also note with sadness the passing this fall of ant biologists Christian Peeters and Eldridge Adams, both of whom are greatly missed.

Carla Cáceres. The Cáceres lab, in collaboration with Brian Allan, Juma Muturi (USDA), Allison Hansen (now UC – Riverside), and Zoi Rapti (Mathematics) has been studying the drivers of community assembly within embedded ecological systems. In particular, we have been investigating, through data-theory coupling, the feedbacks that govern how communities assemble simultaneously across hierarchical scales - from the repeated assembly of food-webs in temporary aquatic habitats (stormwater pools) to the simultaneous assembly of the gut microbiome of individuals colonizing that food web. Undergraduate students, together with former graduate student Christopher Holmes (Evolution, Ecology, & Behavior) have been investigating the colonization of the gut microbiome of larval *Aedes* and *Culex* mosquitoes. In addition, graduate students Luke Hearon (Entomology) and Patrick Wilson (EEB) are working on various aspects of disease ecology in aquatic systems by focusing on the interaction between the *Daphnia* (host), *Metschnikowia bicuspidata* (fungal pathogen) and *Chaoborus* (predator).

Mark Davis. Via a grant from the United States Department of Defense Strategic Environmental Research and Development Program, **Brenda Molano-Flores** and I assessed the efficacy of environmental DNA (eDNA) sampling and microfluidic metabarcoding to document arthropod communities (with an emphasis on pollinators). In a greenhouse, we introduced a colony of Common Eastern Bumble bees (*Bombus impatiens*) into a multi-species flower community. Focusing on four focal flowers (*Monarda, Penstemon, Solanum, Cynoglossum*), we used multiple methods of sampling eDNA from flowers, along with multiple preservation and extraction methods. Finally, using microfluidic metabarcoding technology, we employed a panel of multiple molecular markers to account for inherent taxonomic biases of the primers. We found that not only was our method successful in detecting the bumblebee in question, we also detected beneficial insects introduced into the greenhouse, as well as other arthropods known to occur. These findings were validated in the field, with both observed and unobserved arthropods detected. We presented our findings via webinar (https://bit.ly/3niiKKw) in August, are working to submit the manuscript for review in 2021, and are developing opportunities to expand this research more broadly on DoD installations in the future.

One vexing conundrum emerged in this research that I challenge you to solve: despite a remarkable (albeit anecdotal) abundance of carpenter bees (*Xylocopa virginica*) observed on the UIUC campus in 2019, and indeed on the flowers we sampled, we were unable to detect the species via eDNA. Positive controls revealed that the issue was neither with the microfluidic metabarcoding approach, nor the primers themselves, as positive controls readily amplified. In fact, we sampled flowers moments after observing nectar robbing, and yet did not detect carpenter bees. I ask you, my entomologically inclined friends: what gives?!?

Finally, as I reflect on the past two years, I continue to feel honored, humbled, and extremely privileged to collaborate with Entomology's remarkable graduate students. **Katie Dana** and I explored linkages (https://news.illinois.edu/view/6367/803942) between *Magicicada* emergences, drought, and reproductive output in a northeastern population of copperheads (*Agkistrodon contortrix*) (https://www.nature.com/articles/s41598-019-51810-9). **Eric South**, **Ed DeWalt**, **Jared Thomas**, and I described a new species of stonefly (https://zookeys.pensoft.net/article/33818/). Eric, along with a number of colleagues in Entomology and at INHS, developed a robust phylogeny for the North American stoneflies (https://bit.ly/3a81PXq) using transcriptomic data. Finally, Entomology alumnus **Aron Katz** and I continue to collaborate (though not always in the arthropod arena), and advanced conservation of the federally threatened Louisiana Pinesnake (*Pituophis ruthveni*) via molecular (https://bit.ly/2WbQwFo) tools (https://bit.ly/34cFjc8). Despite the disaster that is 2020, I am buoyed by the creativity, brilliance, and resilience of Entomology's graduate students, and I look forward to continued collaboration in the days and years to come.

Edward DeWalt. I am located at Illinois Natural History Survey and have affiliate status with the Department of Entomology. My students and I work on the taxonomy, ecology, systematics and conservation of aquatic insects, primarily stoneflies (Plecoptera), but significant work also occurs on mayflies (Ephemeroptera) and caddisflies (Trichoptera) (EPT species). We are studying the phylogenomics of Plecoptera (stoneflies) in North America, historic and future distributions of stoneflies across the Midwest, EPT conservation status assessments in Illinois and Indiana, and assessment of two stonefly species in Arkansas and Louisiana for federal endangered or threatened status. Recent funding has come from the USFWS, NSF, and the Illinois Department of Natural Resources.

Chris Dietrich. Because the current pandemic has put a damper on our field work and ability to host international visitors, members of the Dietrich lab have been sorting through the thousands of bulk insect samples from around the world already in our freezers. Postdoc Yanghui Cao has been submitting many of these for anchored-hybrid DNA sequencing and building massive phylogenies containing hundreds of taxa. Another postdoc, Valeria Trivellone is screening samples for the presence of plant pathogens and has, so far, discovered new strains of phytoplasmas representing three previously unknown subgroups from leafhoppers collected in China and Australia. This suggests that screening of phloem-feeding insects is an efficient method for discovering previously unknown phytoplasmas, many of which cause diseases devastating to various crop plants. Prior to the pandemic, several lab members were able to visit Vietnam for the International Auchenorrhyncha Congress. Collecting during and after the Congress yielded many new country records as well as specimens of 2 new genera and at least 15 new species of leafhoppers (some shown in the adjacent photo-montage).

Sam Heads. The last two years have seen lots of change in the Heads Lab. Firstly, we saw the graduation of Nathalie Baena, who successfully defended her Ph.D. in June 2019 and has since moved back to her home country of Colombia. In August 2019 we welcomed our newest Ph.D. student, Cariad Williams, who will be working on fossil insects in Early Miocene Dominican amber as part of our NSF-funded CSBR grant to conserve and curate the Milton Sanderson amber collection here at INHS.

2019 also saw the award of two USFWS-supported State Wildlife Grants to study cicadas and bumble bees in Illinois, both of which are managed by Katie Dana. Our work on fossil insects continues apace, with 2019-2020 seeing the description and publication of numerous new fossil genera and species including, among other things, the first orthopteran from the Triassic of China, the earliest elcanid from the Triassic of Virginia, and a new batrachideine tetrigid from the Eocene Baltic amber.

Perhaps the most exciting development of 2019-20 is the beginning of our move into the new Center for Paleontology in the Forbes Natural History Building. The Center occupies the former PRI library space and, once all renovations are complete, will house all of the university's fossil collections as well as two fully refurbished custom labs. Jared Thomas, Cariad Williams, and I have already moved into our new offices. Construction work has already begun on the new labs so hopefully the space will be finished and ready to go once we can get back into work following the pandemic.

Kevin Johnson. The past two years have been very exciting for the start of three new NSF-funded collaborative projects. The first of these is an award focusing on uncovering the cophylogenetic relationships of tinamous and their lice. Tinamous are an ancient group of birds from the Neotropics and host the highest diversity of lice of any avian group. This study will leverage genome sequences generated at the University of Illinois for both the birds and their lice to build trees of each group and compare them. The second award focuses on the diversification of feather lice more broadly, again using genome sequencing. Finally, I was awarded a US-China Dimensions of Biodiversity project to study the phylogenomics and functional genomics of bacterial endosymbionts of feather lice from songbirds and doves, with a focus on the diversity of these groups in China. Graduate students in my lab, Stephany Virrueta Herrera, and Lorenzo D'Alessio, have been able to take advantage of funding from these projects and are each conducting very exciting thesis projects. While these NSF research projects certainly are keeping me busy, I have also been able to enjoy some bird-watching tours in Bhutan and Colombia, two countries with amazing avian diversity.

Tommy McElrath. Since the last newsletter, we've made great strides improving the infrastructure of the INHS Insect Collection. We've migrated to a new, modern database, joined the Terrestrial Parasite Tracker Thematic Collections Network, and engaged numerous volunteers (500+ hours of work contributed in 2019) to help us transcribe records and re-vial our ethanol collection. We now have a good workflow for UIUC entomologists to voucher both their data and specimens with the insect collection. Contact me to discuss vouchering research specimens (or personal collections) with INHS! (monotomidae@gmail.com)

On the research side, I teamed up with a great group of international collaborators to describe three fossil species of Monotomidae, including getting to name a 90+ million-year-old species, *Lenax karenae*, after my partner. I've also started a project with three main collaborators to try to catalog the entire world fauna of the superfamily Cucujoidea, which hasn't been attempted in 100 years.

On a personal note, my partner helped me complete my personal goal of visiting all 50 US states by going to North Dakota, Hawaii, and Alaska.

Jim Nardi. My laboratory research with *Manduca* has focused on the function of pairs of giant cells that are arranged symmetrically along the dorsal heart in all thoracic and abdominal segments. These secretory cells abruptly expel their protein contents at each molt. They were believed to release their contents on newly formed cuticular surfaces; however, we have shown that at each molt these cells release copious amounts of proteins with immune functions - not externally but internally into the hemolymph. At the larval-pupal molt these same cells release a few of the same immune proteins released at larval-larval molts but predominantly different immune proteins before the cells undergo programmed cell death after pupation.

Comparable giant immune cells are predicted to exist in other insect larvae, and I am beginning to search for these cells in larvae of other holometabolous orders.

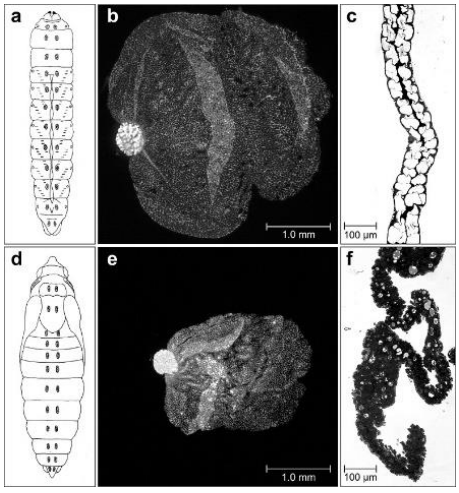


Figure at left. Developmental changes of *Manduca* giant secretory cells at the larval (**a-c**)-pupal (**d-f**) transition showing three different levels of biological organization: organism (**a,d**), dermal gland organ (**b,e**) sections of dermal secretory cell (**c,f**).

For the past 27 years I have been involved with habitat restoration in Parke County, Indiana. In the past five years I have worked with the local Quabache Land Conservancy to expand the restoration now known as Atherton Island Natural Area. During the summer I collected seeds of 32 species of wildflowers and seeds of a few short grass species for a December 2020 planting of a 5-acre pollinator habitat. In the spring we will begin restoring 38 acres of highly erodible fields to forest by planting thousands of oaks and hickories trees. Two alumni of the department – John Tooker, Andy Deans – recently stopped at this natural area to collect gall wasps for their study of the phylogeny of the cynipid wasp *Anistrophus*. Next spring the periodical cicadas on the natural area are scheduled to put on their spectacular show once again as they have every 17 years for countless millennia.

During the past three years, I have had many hours free of distractions to work on Illustrations and text for a book about the hidden company that trees keep - mostly about insects but also about endophytes, epiphytes, and various microbes.

A relieved Joe Spencer holding the last root from his 2020 root season

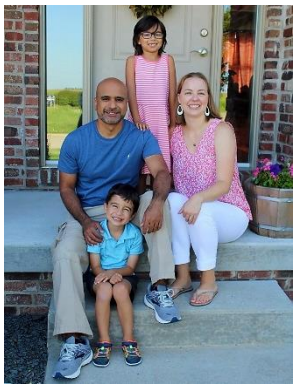
Joe Spencer. Despite significant COVID-19 adjustments, my 2020 field and laboratory activities went forward. My research program is focused on western corn rootworm behavior, ecology and resistance. Working alone in an essentially empty building during the spring, I started bioassays and planned field work that was ultimately accomplished with a great socially-distanced crew of undergraduate assistants who joined me for June - August. I've always found fieldwork refreshing, but never more so than in 2020. Time working in broad, open outdoor spaces largely offered a respite from the constraints of indoor activities. My 2020 fieldwork was the only thing that made my worklife seem normal…well, almost! Though my travel was very limited, I managed to also fill my free time with lots of insect photography and a thorough "investigation" of the biodiversity in my own backyard and a few nearby natural areas.

Chris Stone. The INHS Medical Entomology Lab has undergone some exciting changes these past two years. We welcomed graduate students Kylee Noel, Erica Hernandez, Emily Struckhoff, and Sara Wilson to the lab, who have all started making exciting progress on mosquito- and tick-related research projects. Teresia Njoroge (co-advised with May Berenbaum) graduated this past summer. Research and vector surveillance collaborations with the Illinois Department of Public Health have become a larger part of our lab's activities, with a statewide tick and tick-borne pathogen surveillance program being led by Holly Tuten, and a new program spearheaded by Andrew Mackay looking to update our knowledge of mosquito communities throughout the state and the assemblages of viruses associated with them.

Holly Tuten. I run statewide tick surveillance and conduct research on mosquitoes for the INHS Medical Entomology Lab. 2020 has certainly been interesting and challenging! We managed to collect, identify, and test ticks from May - December (while also training personnel at local health departments and mosquito abatement districts in tick collections) and our data were used to update the IL-DPH tick maps (https://bit.ly/3geRxWn). In July, our IL-DPH tick grant was renewed for three years. I also worked on several projects related to regulation of genetically modified mosquitoes; the second week of December I will be an invited participant at a workshop on the subject (https://fnih.org/what-we-do/geneconvene/impact/key-questions) (hosted by the FNIH and funded by the DARPA Safe Genes program). As the Secretary of the IL Mosquito & Vector Control Association I helped organize its 66th annual meeting (and first virtual meeting) held on Nov. 5th, 2020 - we had presentations on national, regional, and local vector-borne disease topics and were able to provide IL-DPH continuing education credits to attendees. In addition, I gave seminars on ticks and tick-borne diseases in Illinois for the Champaign Park District (https://bit.ly/3mhvorN), University of Illinois Extension, UIUC Entomology Dept., and the Annual Meeting of the Illinois Rural Health Association. I will have presentations this December with a student group of the Science National Honor Society and the Global Lyme Alliance. With 2 young kids at home, I've worn many hats this year but have found solace in my research and service and joy in the extra family time. However, I'm ready for a long winter's nap.

ACADEMICS / POSTDOCTORAL SCHOLARS

Bernarda Calla. Despite personal and professional struggles of 2019, and the continued challenges of 2020, I am happy to say that I made some significant progress on the research front. I continued working on the genomes of the wax moth and the navel orangeworm and I am now exploring new frontiers by looking at microbiomes of different insects and systems. I also had the pleasure of working with Teresia Njoroge and Chris Stone on a transcriptomics study of *Aedes albopictus*. During the pandemic, I have been an editor-in-training, working as a Guest Editor for *Current Opinions in Insect Science* and I will soon start a two-year tenure as the Assistant Features Editor for the *Plant Physiology* Journal. We had several manuscripts accepted and/or submitted and we are on track for a great start of 2021.

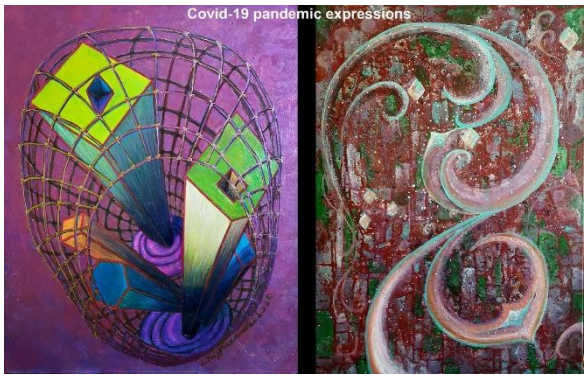


Amy Cash Ahmed. I have been the Lab Manger for the Robinson lab since 2012 and our research and the bees keep me busy! We have had a wonderful past 2 years of research, working on projects ranging from single cell RNA sequencing to CRISPR to microRNA to the honey bee microbiome and even trying to rear honey bees in the laboratory! I love the research but it's our wonderful lab members that make my job especially rewarding.

Outside of lab, my 7-year-old daughter, 5-year-old son, and husband keep me on my toes. We love being outside, eating ice cream, and the kids even like to play with the bees when they can!

Lesley Deem. This has been a much quieter year for me than I am used to. I am looking forward to having the school kids back for visits and the bees buzzing about the Pollinatarium again. My highlight for the year has been a set of articles published in the News-Gazette promoting planning and planting habitat for pollinators and ourselves. Away from work I go walking and hiking with my dog Honey Bea (Honey Beatrice). She enthusiastically greets friends and neighbors. I have a lot of cookie recipes I want to make and do not need to eat them all. So let me know if you have a favorite and I can leave some on your porch or at your door. Stay safe.

Page Fredericks. I am wrapping up my time in Brian Allan's lab by working on several manuscripts, primarily on the unique Fluidigm and Illumina high throughput sequencing methods we employed to identify pathogens and other tick-borne organisms in the Midwest and southeastern North America. This also includes the submission of several million sequences to NCBI. In my off hours I have created several paintings expressing my feelings during the pandemic a subsample of which is shown here.



Gyan Harwood. My research focuses on viral pathogens that threaten honey bee populations. In particular, I study how Israeli acute paralysis virus affects different caste members within a colony, which may affect how the viruses spreads within and between colonies. I also examine how pesticide exposure can disrupt antiviral immune pathways in bees.

Ling-Hsiu with Fotor

Ling-Hsiu Liao. The highlight for 2020 for me was giving three invited public talks regarding defense strategies of xenobiotics of honey bees as a superorganism in Taiwan and wrote my first Mandarin review article regarding fungicides and honey bee health in a Taiwan government newsletter. Besides that, I worked with Dr. Sydney Cameron, Dr. Ruben Blazquez, Wen-Yen Wu, and Will Montag on a bumble bee project. This is the first time we have a picture in a local newspaper! Although no face could be recognized in that photo, that photo looks like a small group of people doing a special ceremony late at night. (Actually, we were trying to locate a bumble bee hive. Photo by Alison Sankey.)

Furthermore, I worked with May to publish two research articles regarding the effects of phytochemicals on honey bees and did two reviews. Currently, most of my research focuses on the interaction of phytochemicals, pesticides, and adjuvants on honey bees and the effects of the hive microbiome on honey bee health.

Morgan Mackert. I joined the Harmon-Threatt lab as a research specialist during the summer of 2019, which makes this my very first contribution to the entomology newsletter! Since joining the lab, I've managed to stay quite busy – contributing to the collection of over 7,000 bees, counting millions of flowers, and spending countless hours walking through prairies with a net in hand. All of this work will further advance our understanding of the impacts agricultural practices can impart on the native bee communities in Illinois. When I'm not wrangling bees and smelling flowers, I enjoy watching horror movies with my cat, attempting to cook, and reading any book I can get my hands on (suggestions always welcome!).

Rubén Martin Blázquez. I am a postdoc in Sydney Cameron's lab, studying how the neonicotinoid pesticide imidacloprid and the microsporidian parasite *Nosema bombi* affect gene expression in threatened and non-threatened bumble bee species. This project has required that we rear wild species of declining populations in the lab, which has been itself a challenge, and collect transcriptomic data from developing larvae, another challenge. Results to date indicate that the vulnerable species *Bombus occidentalis* (found west of the Rockies) responds significantly to *N. bombi* infection by upregulating or downregulating genes associated with chitin metabolism and defense response; the stable species, *B. impatiens* (found east of the Rockies), shows significantly less differential gene expression with *N. bombi* infection and is less readily infected. On the other hand, *B. impatiens* exhibits a significantly greater transcriptomic response to the pesticide imidacloprid, affecting genes related mostly to metabolic processes. We are currently testing two additional species, one vulnerable (*B. terricola*) and one stable (*B. griseocollis*), for any evidence of differential gene expression; we are especially interested to see if the patterns found in the originally tested declining and stable species are consistent in physiological responses to *Nosema* and imidacloprid. We are also preparing the groundwork for a *de novo* genome sequence assembly of *N. bombi*.

Melissodes denticulate brood cell

Colletes inaequalis brood cell

Joshua Villazana. I joined the Harmon-Threatt lab as a research technician during the height of the pandemic in May 2020! It has been an interesting transition from completing my Masters in Entomology at the University of Maine studying black soldier flies to working at the Natural History Survey identifying arthropod and vegetation samples from wetlands in southern Illinois, and finally leading novel research on lab-rearing ground-nesting bees.

Since joining the lab, I have managed to some extent to successfully rear *Colletes inaequalis* in glass observation nests. Hopefully, this will broaden our understanding of the long-term effects of soil contaminated with neonicotinoids on the development of ground-nesting bees. I was also capable of excavating 115 brood cells of *C. inaequalis* and 251 *Melissodes denticulata*, to use for establishing colonies in a lab-reared experimental setting.

When I am not nose-deep in corbiculae, I enjoy challenging myself with the pandemic trend of baking sourdough bread, other cooking feats inspired by cooking shows, playing virtual boardgames, and spending time with my partner on many hikes in Shawnee National Forest.

Observation nest with bee made tunnel

Sourdough Fougasse Flat Bread

STAFF

Todd Fulton. Well, it's been a very interesting 2020 season. As an "essential" employee, the Insectary "lodgers" have been maintained as always. At times it's been difficult during this "COVID19" period to adjust to ever-changing precautions/recommendations. However, "so far so good".

I look forward to our future!!!!!

Kim Leigh. It's hard to believe that I'm about to start my 9th year as the office support for the Department of Entomology! Where does the time go? I think, though, we all could have done without this past year. 2020 is definitely a year I would prefer not to think about; however, I am very thankful that so far all of my family members, friends, and members of our department have made it through this tumultuous year. Due to the pandemic, I was unable to take my annual summer trip up to Canada to visit with my parents for a few weeks this past summer. I am very much looking forward to things returning to some sort of normalcy by this coming summer so that I can take an extended vacation to visit them and to possibly do other travel.

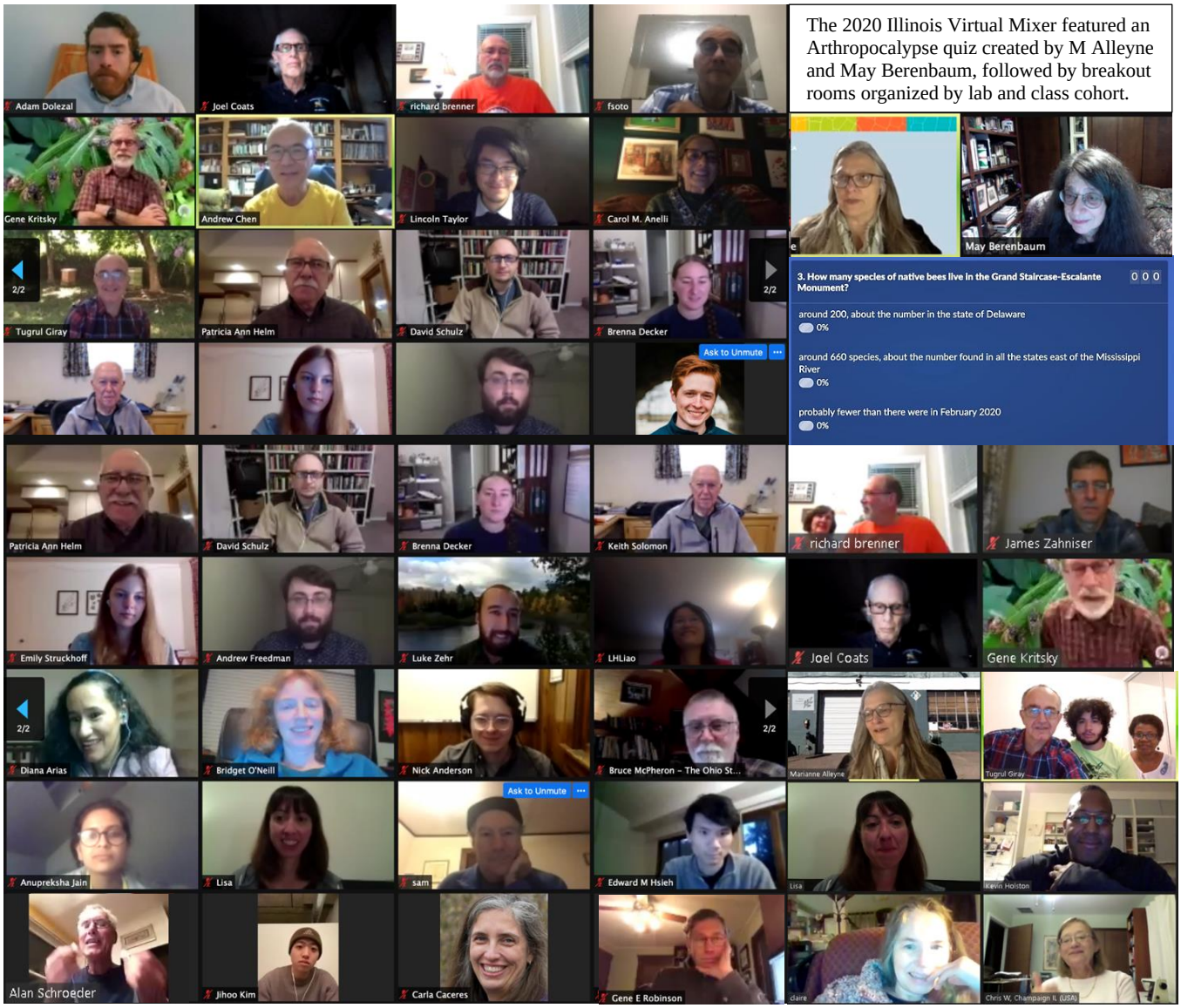
ENTOMOLOGICAL SOCIETY OF AMERICA MIXERS

2019

L→R Top: Jon Tetlie, Evan Newman; toasted ravioli; Yehuda Ben-Shahar, Gene Robinson; Zhimou Wen, Rensen Zeng
Row 2: Hanks Lab John Tooker, Matt Ginzel, Joe Wong, Annie Ray, Rob Mitchell: Hongmei, Gene Robinson, Tugrul Giray; Adam Smith, Josh Gibson, Andy Suarez
Row 3: Berenbaum Lab past and present (Ren-Sen Zeng, Ed Hsieh, Teresia Njoroge, Zhimou Wen, Bridget O'Neill, Charles Dean, May Berenbaum, Duane McKenna); Joel Coats, Jon Tetlie; Carol Anelli, Gail Kampmeier, Diana Cox
Row 4: Julia Fine, Alex Harmon-Threatt, Diana Cox; Rob Mitchell, Scott Shreve; Jamie Strange, Reed Johnson, ooey-gooey butter cake

2020

2020 ENTOMOLOGY VIRTUAL ANNUAL MEETING



The 2020 Illinois Virtual Mixer featured an Arthropocalypse quiz created by M Alleyne and May Berenbaum, followed by breakout rooms organized by lab and class cohort.

COLLOQUIUM SPEAKERS

Spring 2019

Jan 17	**Ke Dong**, Michigan State U	*Voltage-gated sodium channels as insecticide targets*
Jan 28	**Esther Ngumbi**, Entomology, UIUC	*Volatile organic compounds as multitrophic messages among plants, microbes, and insects*
Feb 4	**Mariana Mateos**, Texas A&M	*Symbiont-mediated defense against parasitoids in Drosophila*
Feb 11	**Simon Garnier**, New Jersey Inst. of Tech.	*We the Swarm - Lessons in problem-solving from tiny brains and neuron-less creatures*
Feb 18	**Colin Dale**, U of Utah	*Replaying the tape of symbiosis in lice: The role of Neo in the Matrix*
Feb 25	**Jeff Feder**, U of Notre Dame, IN	*On the scent of speciation: evidence suggesting a neurological switch in fruit volatile processing involving the antennal lobes of the apple and hawthorn host races of Rhagoletis pomonella*
Mar 4	**Diana Cox-Foster**, USDA, Logan, Utah	*Imperiled keystones of agriculture: The threat of unseen factors on the health of pollinators*
Mar 11	**Holly Gaff**, Old Dominion U, Norfolk, VA	*Mapping the range expansion of ticks: modeling and surveillance*
Mar 25	**David Denlinger**, Ohio State U	*How to survive in Antarctica: Lessons from an insect*
Apr 1	**John Tooker**, Pennsylvania State U	*Toxic slugs and plants that can smell: Unforeseen interactions alter herbivore populations*
Apr 8	**Courtney Murdock**, U of Georgia	*In sickness and in health: mosquito love songs, mating behavior, and vector-borne disease transmission*
Apr 15	**Mark Demkovich**, Student Exit Seminar	*Identifying mechanisms of pyrethroid resistance in the navel orangeworm and novel methods of control*
Apr 22	**Clare Rittschof**, U of Kentucky	*From the outside in: Social regulation of behavior and health in the honey bee*
Apr 29	**Nathalie Baena**, Student Exit Seminar	*From extant to extinct tridactyloids (Orthoptera: Caelifera): taxonomy to systematics*

Fall 2019

Sep 9	**Akito Kawahara and Caroline Storer**, U of Florida	*Evolution and diversity of butterflies and moths: from bat-moth interactions to silk genomics*
Sep 16	**Julia Bowsher**, North Dakota State U	*How to build a bigger bee: the regulation of body size and caste*
Sep 23	**Laura Russo**, U of Tennessee	*Building plant-pollinator communities*
Oct 7	**Roberto Bonasio**, U of Pennsylvania	*Molecular bases of phenotypic plasticity in the ant brain*
Oct 14	**Claudio Gratton**, U of Wisconsin, Madison	*Towards sustainable agricultural landscapes: upending the paradigm*
Oct 21	**Kerri Coon**, U of Wisconsin, Madison	*Microbial regulation of molting in mosquitoes*
Oct 28	**Sedonia Sipes**, Southern IL U, Carbondale	*Bee-plant relationships: ecology, evolution, and biodiversity patterns*
Nov 4	**Nick Seiter**, Crop Sciences, UIUC	*Developing IPM practices for invasive and emerging pests of agronomic crops*
Dec 2	**Jessica Ware**, Rutgers U	*On the divergence of insects: using systematics to better understand the evolution of insect sociality, migration and flight*
Dec 9	**Jory Brinkerhoff**, U of Richmond	*Eco-epidemiology of tick-borne diseases in an area of increasing tick-borne disease incidence*

Spring 2020

Jan 27	**Michael Dickinson**, CA Inst. of Tech	*How flies fly*
Feb 3	**Andrew Short**, U of Kansas	*Aquatic beetle diversification: A tale of ecological promiscuity and geographic constraint*
Feb 10	**Valeria Trivellone**, Dietrich Lab, UIUC	*Evolution of complex interactions between plants, pathogens and insect vectors*
Feb 17	**Graham Thompson**, Western U, Ontario, Canada	*Genes for altruism: inclusive fitness theory in the age of genomics*
Feb 24	**Carly Tribull**, Farmingdale State College, SUNY	*EduComics and Insects! Fitting together outreach, education, and entomology as an early-career professor*
Mar 2	**Gyan Harwood**, Dolezal Lab, UIUC	*Social immunity and host-pathogen interactions in honey bees*
Mar 9	**Teresia Njoroge**, Student Exit Seminar	*Evaluation of the role of plant-derived chemicals on mosquito ecology and control*

Fall 2020

Aug 24	**Corbyn Giers,** Student Exit Seminar	*Effects of anthropogenic change on interactions between North American Tephritid flies and their biotic associates*
Aug 31	**Holly Tuten**, INHS, UI	*A ticky situation: Building a statewide tick surveillance program in Illinois*
Sep 14	**Ashley St. Clair**, Dolezal Lab, UIUC	*A life in the green desert: Wild and managed bee response to Midwestern soybean agroecosystem*
Oct 5	**Priscila Hanisch**, Suarez Lab, UIUC / Museo Argentino de Ciencias Naturales	*Integrative approaches to study the diversity and ecology of South America's predatory ants (Formicidae: Ponerinae)*
Oct 19	**Kacie Athey**, Crop Sciences, UIUC	*It's raining moths: Drone technology for sterile codling moth release*
Oct 26	**Bernarda Calla**, Entomology, UIUC	*Genomic and evolutionary insights from the sequencing of two Lepidoptera species*
Nov 2	**Eric South,** Student Exit Seminar	*Molecular phylogenetics of the North American stoneflies (Insecta: Plecoptera), with description of a new species and family*
Nov 9	**Ophelia Bolmin,** Mech. Sci. &Eng., UIUC	*Overcoming muscles limitations: Power amplification in click beetles*
Dec 7	**Jim Whitfield,** Entomology, UIUC	*Evolution of symbiotic parasitoid viruses in Hymenoptera*

Jessica Ware

Michael Dickinson

David Denlinger

ALUMNI / NEW STUDENT FALL PICNIC

2019 Distinguished Alumnus Seminar: Claudio Gratton, University of Wisconsin-Madison

CELEBRATIONS

February 21, 2019
Celebration of Gene Robinson's Wolf Prize and election to the National Academy of Medicine





Holiday Party 2019





March 26, 2019
Regional Meeting of the National Academy of Sciences (part of a long tradition)

At the UIUC Pollinatarium, NAS regional meeting, 2012

2019 NAS Executive Director Ken Fulton, member Gene Robinson, President Marcia McNutt, NASEM EO Bruce Darling

Seven buildings on the UIUC campus are named for scientists who were members of the National Academy

Roger Adams Laboratory		Roger Adams	
Beckman Institute for Advanced Science		Arnold Beckman	
Forbes Natural History Building		Stephen A. Forbes	
Gottfried Fraenkel Greenhouse		Gottfried Fraenkel	
Loomis Laboratory		F. Wheeler Loomis	
Noyes Hall		William A. Noyes	
Carl R. Woese Institute for Genomic Biology		Carl R. Woese	

THE DAILY ILLINI

Student Newspaper of the University of Illinois

CENTS CHAMPAIGN-URBANA, WEDNESDAY, OCTOBER 19, 1927

R. O. T. C. NAMES 450 OFFICERS FROM CADETS

Col. Merry Announces Promotions, Show Increase Of 150 Over Last Year

More than 450 appointments in the University R. O. T. C. have been announced by Col. William T. Merry, commandant. The figures show an increase of about 150 cadet officers since last year.

The lieutenant colonels for the various units are as follows: H. S. Hayward, infantry; L. B. Sommers, field artillery; H. L. Kinne and W. R. Whittaker, cavalry; C. W. Swartz, signal corps; Raymond Plummer, engineers and C. K. Moore, air corps.

Infantry Appointments

Other officers in the infantry unit are as follows: Majors, E. S. Case-

250 Scientists Attend Opening Session Of National Academy; Hear Day Discuss Volcanoes

COUNCIL DISMISSES TWO FOR STEALING; ONE FOR GAMBLING

Three men were dismissed from the University by the council of administration yesterday afternoon, two for taking money and other valuables from gymnasium lockers and the third for gambling.

One man and one woman were suspended from the University for the next two weeks for violating the no-car ruling. The man had a car contrary to University regulations while the woman was driving a car without a permit.

Two men were placed on probation for over-cutting. One fraternity's petition to have a formal dinner dance the night prior to Christmas vacation was denied.

"The Volcano Problem" was the subject of the address made by Dr. Arthur L. Day of the Geophysical Laboratory, Carnegie Institution, Washington, last night in the Auditorium before an audience of more than 250 people consisting of members of the National Academy of Sciences, national and international authorities on practically every branch of science, and faculty men.

The lecture marked the close of the first day of a three-day session of the National Academy which is meeting here for its autumn convention.

The meeting in the Auditorium was opened by Prof. W. A. Noyes, retired head of the department of chemistry, and chairman of the local committee of Academicians in charge of the program, at 8 o'clock.

The lecture was followed by a smoker at the University club for members of the Academy and participants on the program.

FINAL PLANS HURRIED FOR HOMECOMING

Line Of March For Annual Hobo Parade Is Announced, Stamp Sale Starts Today

With the eighteenth annual Homecoming but one week and a half in the offing, final preparations in all lines of work connected with the event are being carried to completion in expectation of one of the largest Homecomings on record, it was stated yesterday by N. A. Giants '29 and Eleanor Lambert '28, general chairman and woman's chairman respectively.

The line of march for the Hobo parade, which is in charge of E. E. Dierking '28, has been announced. Entrants will gather at 10 o'clock the morning of October 29 at the corner

GRADUATE STUDENTS

Nick Anderson. I am in the final year of my Ph.D. in Dr. Alex Harmon-Threatt's lab. My primary research interests revolve around insect diversity in fragmented landscapes. I'm particularly interested in the roles of movement between patches and trophic interactions in determining which species persist. This work has taken me to southeastern Missouri (near the Mark Twain National Forest) and WashU's Tyson Research Center outside of St. Louis. Over the past couple of years, this research has been supported by SIB and department funds and a Dissertation Completion Fellowship from the Grad College. In addition to my research, I've mentored four undergraduate students on independent research projects. The first with Anna Grommes (now a grad student in the department) was recently published in *Apidologie*. The remaining three are wrapping up this school year and will submit their work to journals by the summer. On the teaching/TA front, I will be taking over Brian Allan's IB361 (Ecology and Human Health) while he is on sabbatical this spring. I'm looking forward to the challenge of leading a course for the first time during a global pandemic!

Elizabeth Bello. I am a first-year master's student in Dr. Marianne Alleyne's ABCLab. My work focuses on the unique characteristics of various insect cuticle morphologies which can be used for the innovation of bioinspired designs and materials. This past summer I arrived in Urbana-Champaign from New York after receiving the Fred H. Schmidt Summer Scholars Award. Although my ability to conduct research has been limited due to COVID-19, I have begun to examine the characteristics of leafhopper brochosomes and the wing topographies of dragonflies and damselflies. I was also recently elected a Student Affairs Committee member for the PBT section of ESA, which I'm looking forward to! In future semesters I hope to study the wing topographies of flies in addition to testing the antimicrobial efficiency of fabricated cicada wing replicates produced by the ABCLab and collaborators. I would also love to travel and collect uniquely adapted insects from extreme environments to study. When I'm not working, I enjoy staying active and spending my time outdoors either fishing, hiking, or kayaking.

Blacklighting for leafhoppers 2020. Photo by M. Alleyne

Daniel Bush. My first few years here in Urbana-Champaign felt pretty static, but I've taken some new directions since the last department newsletter. I finally branched out from insect-fungus interactions in my research and picked up a few new projects to flesh out the dissertation. Mark Demkovich and I have been playing around with kaolin for the last year, and we think it has a lot of promise as a tool for navel orangeworm IPM. I have found this foray into more applied entomology to be surprisingly refreshing, and we're hopeful that the tree nut industry will be interested. Bernarda Calla and I have also been diving further into the mycological world while collecting and studying fungi from honey bee hives. Outside of work, I became an uncle twice over--and I gave some friendly entomological advice to my own uncle, who is an engineer piloting some new insect monitoring technology. This should be my last year here in UIUC Entomology, so here's hoping it's a good one.

Erica (Hernandez) Cimo-Dean. I am a master's student in the Stone lab in the second year of my degree and plan to finish this summer. My time at U of I has held many firsts for me. I came to U of I in 2015 for a bachelor's degree and six years later I will be leaving with two degrees, a start in a field I'm passionate about, and my best friend's last name. I've been involved in research since undergrad and in many ways finishing my degree here feels like leaving home. I'm incredibly grateful for the many opportunities I've had during my time here and the support of my many mentors.

My master's work is focused on the impact of habitat fragmentation, soil composition, and other abiotic factors on the establishment of the blacklegged tick, *Ixodes scapularis*, in Illinois. This tick species is understudied in Illinois and likely increasing its distribution across the state. It is a vector of disease agents that can cause Anaplasmosis, Babesiosis, *Borrelia miyamotoi* Disease, Lyme Disease, and Powassan virus

disease. During the course of my graduate matriculation, I have been learning how to collect and identify ticks and test them for pathogens, build databases, and conduct statistical analyses. I was also part of the environmental investigation that led to the discovery of Heartland virus in Illinois ticks and was a co-author on the resultant publication in the CDC Emerging Infectious Diseases journal in July 2020. After completing my master's degree, I plan to pursue a PhD and continue studying disease ecology.

C. Scott Clem. Hello everybody. I am a fifth-year PhD candidate in Alex Harmon-Threatt's lab. So many things have happened since the last newsletter. Perhaps most notably, I was awarded a USDA NIFA Predoctoral 2-year Fellowship to study the migratory behavior of some North American hover fly species (Syrphidae). This has led to some exciting results, which I hope to publish soon. My plan is to complete my dissertation and secure a job/postdoc within the next few months, so I am excited for what is to come!

Kat Coburn. Amongst These Unpredictable Times, I have started my first year as a master's student in the Harmon-Threatt lab! I was lucky to participate in fieldwork at Phillips Tract over the summer with my lab mates. I joined the lab with goals to pursue research investigating the design of land management and its capabilities to benefit both humans and insects! In the process of developing my thesis, I have been thankful to know other incoming students in the program and build a sense of community throughout the madness. Outside of the department, I enjoy embroidery, rollerblading, and warm cups of tea!

Katie Dana. Well, 2020 sure put a kink in my plans! This year we finished our second field season of two State Wildlife Grants on cicada population genetics, habitat heterogeneity, and bumble bee distribution in Illinois. While it was nice getting outside… having to drive separate cars, not staying in hotels, and a late start date sure slowed us down! But a special shout-out to the undergrads in our lab, Natalie Mills and Grace Lewis, as well as graduate student Jon Tetlie for working through such difficult circumstances. As for my dissertation, there is an end in sight! Before Christmas I'll be submitting a library of 450 cicadas collected over six field seasons for sequencing (ddRADSeq) to look at their population genetics and life history – both exciting and terrifying! Who thought working on cicadas was a good idea? Oh right…

Charles Dean. I am currently working to complete my final year as a PhD student in laboratory of Dr. May Berenbaum. In the two years since my last update, I have not only made much progress in researching the genetic and physiological mechanisms underlying the coevolutionary relationships between apiaceous plants and web-building caterpillars, but I have also expanded my focus to include new and exciting avenues of scientific inquiry! Thus far I have investigated the survivorship of multiple *Depressaria* species after having ingested both linear and angular furanocoumarins – a chemical defense commonly found in their hostplants. I have also described the enzymatic metabolism of these furanocoumains in the midguts of *Depressaria* spp. Additionally, I explored the genetic basis of pigment sequestration across multiple species of Lepidoptera. I am currently using haplotype mapping to track the westward expansion of the invasive *Depressaria depressana*, as well as building a de novo transcriptome to further understand this species' detoxification of furanocoumarins. Lastly, I am using next-gen sequencing to construct a molecular phylogeny of the genus *Depressaria*. In other news, I will be marrying my best friend in December and I am very excited to share a life together!

J. Matt Flenniken. Since August of 2019, I have been working toward my MS in Brian Allan's lab, where I study tick-borne disease ecology. 2020 has been an exciting year for research. I am currently working on a project investigating the distributional ecology of the Gulf Coast tick in the state of Illinois. Data collection for this project has taken me all over Illinois, which has been a pleasure to explore as an out-of-state-er. As the year presses on, I hope to continue making progress on this project, addressing new questions about this species' distribution in the Midwest and what it means for peoples' exposure to tick-borne diseases.

Joshua Gibson. I am a fourth-year PhD candidate in the Suarez lab studying functional morphology and evolutionary biomechanics of power-amplified mandible mechanisms in ants. Since the 2017-2018 newsletter I have completed a second field season in Australia collecting myrmicine trap-jaw ants. While the initial 2018 trip was a bust for getting live specimens due to export permit issues, this second trip was quite fruitful. I have been able to successfully examine the mandible strike kinematics of Australian endemic genera *Orectognathus* (4 spp.) and *Epopostruma* (1 sp.) since returning with some exciting results, including that both genera unexpectedly have asymmetrical mandible strikes! Fall 2019 included a trip to Corrie Moreau's newly established lab at Cornell to perform DNA extractions and targeted enrichment of ultraconserved elements in Dacetine trap-jaw ants as part of an effort to reconstruct a species-level phylogeny of the group. I have published three papers (2 first author/co-first author and one fifth author) since the previous newsletter, including my master's work on ants in bird nests, SIB undergraduate alumnus Dajia Ye's honor's thesis on jumping mechanics in the neotropical ant *Gigantiops destructor*, and a paper from the Moreau lab on the microbiome of the trap-jaw ant *Daceton armigerum*. Our lab's collaboration with Evan Economo's group on the evolutionary origins of power amplified mandibles in the hyper-diverse trap-jaw ant genus *Strumigenys* is well on its way to be published within the next month or so as well, which is very exciting news! In addition to my ant work I continue to study mantisfly strikes and have started a collaboration with former Suarez lab postdoc Adrian Smith on the description of a novel jumping behavior in a larval beetle. I am in the process of wrapping up my dissertation this year and should be out the door by August 2021.

Anna Grommes. I am a first-year master's student in the Hanks Lab, studying the chemical ecology of beetles in the families Cerambycidae and Elateridae. I graduated from UIUC in May of 2020 with an IPS-Entomology degree. This semester I had the opportunity to present at the annual ESA conference regarding work done this past summer on pheromone lure release rates. I also had the pleasure of teaching the lab sections for IB401 this semester and as a side project have been organizing and replacing damaged specimens in the NHB insect collection. In my free time I enjoy tending to my large houseplant collection and spending time outdoors.

Luke Hearon. After arriving to Chambana in the fall, I set to work getting myself situated in the Cáceres lab. Though I initially intended to pursue zooplankton (namely, the crustacean subclass of Copepoda) as biocontrol against larval mosquitoes, I began to fall out of interest with the idea as it began to seem too speculative. However, while in pursuit of copepods in the field, I captured a host of other aquatic critters and devoted more time to their observation than I will ever confess to Carla. As a result, I became enchanted by the spectral larvae of the midge genus *Chaoborus*. One class project later (thanks, May!) and I was convinced to abandon Crustacea in favor of their better insect cousins. Building on previous work of Carla and others in the Cáceres lab, I am hammering out the outline of a thesis investigating the predation of *Chaoborus punctipennis* on *Daphnia*, and how this predation influences disease epidemics within *Daphnia*.

Edward Hsieh. I successfully defended my Master's thesis in the summer of 2020 on the ameliorative effects of phytochemicals on honey bee virus infection and immediately transitioned into the PhD program the following fall, choosing to remain in my current co-advising situation with Drs. May Berenbaum and Adam Dolezal. I am hoping to expand upon the work completed in my masters by incorporating pesticide exposure as well as diet composition in the virus-diet-pesticide interaction matrix of adult and larval honey bees. Additionally, I have TA'ed my first entomology core course, Insect Physiology, and presented my first talk at the national Entomological Society of America meeting, both of which I found to be very enjoyable experiences, in spite of the limitations induced by the ongoing pandemic. A year of firsts, to be sure! The pandemic also spurred me to pick up a few new hobbies, including macro-photography and birdwatching, both activities that can be done while isolated at home trying not to go slowly insane.

William Montag. I am an outgoing Master's student in the Berenbaum Lab studying the dietary preferences, morphology, and fungal associations of the small hive beetle *Aethina tumida*. In summer of 2020, I successfully defended my M. S. thesis on the morphology and fungal associations of the small hive beetle. Additionally. I'm currently studying the dietary preferences of small hive beetle toward monofloral honey strains and editing the results and my thesis chapters for future publication.

Brendan Morris. I spent the early half of 2019 preparing a taxon sampling of the largest and only worldwide distributed subfamily (Centrotinae) of treehoppers, which will serve as the "main course" of my dissertation and contribute to a larger phylogenomic analysis of the family being undertaken by Micah Fletcher, a PhD student in Dr. Sarah Kocher's lab at Princeton. Over the summer, I spent two weeks chasing treehoppers and eating tacos in the mountains of southern Mexico with Adilson Pinedo (co-advised by my advisor Chris Dietrich). As these hunts for the most rare centrotine treehoppers typically go, our survey yielded none of the target taxa, but we did sweep up a few potentially new species of telamonine and smiliine oak treehoppers!

While 2020 quickly devolved into the mess that needs no mention, it did begin on a very high note! In February, Chris and I published a new genus and species of treehopper, *Kaikaia gaga*, described from a single female specimen collected nearly 30 years ago in Nicaragua. As you might guess, the species epithet honors one of the most morphologically diverse pop stars of our time, Lady Gaga. Thanks to her mega famous namesake, *K. gaga* and treehoppers in general gained significant global media attention with Google searches for "treehopper", "Membracidae" and "Lady Gaga bug" (in various languages and regions) peaking for the first time in observable history, and even landed an article on Rollingstone.com! True to 2020, the news also resulted in the birth of a novel conspiracy theory on Twitter! As the 15 minutes of treehopper fame began to wane at the end of March, Adilson and I trekked down to the type locality in Nicaragua to begin the search for more representatives of *K. gaga* and relatives, but our trip was abruptly cut short due to that other (in)famous bug. Not all was lost, however, as we made valuable contacts during our short time there and I have since secured the Tinker Fellowship to continue our work once conditions improve!

Sarah Murphree. It's exciting to be a part of the Entomology newsletter for the first time! I'm a second-year Master's student in the Robinson lab working on honey bee behavior inside of the hive. I have been analyzing how the trophallaxis network and individual interactions change after introducing outside perturbations (imidacloprid, octopamine) by processing images of hives of barcoded bees. Managing to conduct research and barcode tens of thousands of bees during a pandemic was challenging but, with the right help, we were able to collect the data we needed and stay healthy in the process.

Highlights of these past two years include meeting my lab and department, attending two ESA conferences (one virtual), volunteering for Entomology outreach, and face-painting at the IFFF. I loved finally getting to work with honey bees and transitioning from Computational Physics to Entomology!

Evan Newman.

Kylee Noel. Hello there! I am a 2nd year PhD student in the Illinois Natural History Survey (INHS) Medical Entomology Lab and Dr. Chris Stone is my advisor. My research focuses on the genetic and physiological effects of insecticide resistance in mosquitoes. The past couple of field seasons I have focused on collecting and testing mosquitoes throughout all of Illinois to develop a better understanding of the status and prevalence of insecticide resistance in the state. When I am not in the lab or field I'm at home spending time with my wonderful husband Ty and our pups Zephyr (Husky) and Lucy (Westie).

Rachel Skinner. Over the last two years, I have continued my work as a PhD student in the Dietrich lab studying the systematics and evolution of Auchenorrhyncha. I have been fortunate to present this work at several conferences, including international conferences in Canada and Germany. Like many others, I have been adjusting to virtual research and teaching since March. In my non-research time, I have served as president of the Graduate Students in Ecology and Evolutionary Biology organization and have been enjoying making insect and nature-themed art.

Eric South. I am most thankful for all of my colleagues and teachers who helped me complete my PhD in December 2020. My current research plan is the description of a new family of stoneflies, followed by a phylogeny of the stonefly world fauna.

Emily Struckhoff. I am a first-year master's student in the Illinois Natural History Survey Medical Entomology (Chris Stone's) Lab. My research interests center around the taxonomy and biogeography of ticks in Illinois and how populations are impacted by climate change and extreme weather events. I am currently examining historical tick distributions throughout the state, and I spent this past summer and fall assisting with statewide active surveillance for ticks and tick-borne diseases.

Daniel Swanson. I am now in my fifth year of my doctoral degree. Like many, I have been somewhat waylaid by the current global health crisis, including some arrested travel grants. My dissertation focuses on a taxonomic revision of a cluster of visually striking extant assassin bug genera and using them to explore levels of phylogenetic signal in cuticular armature. I enjoyed a semester TAing Physiology (with the iconic Crab Lab) prior to the pandemic, and, more recently, I have been able to identify aquatic macroinvertebrate samples from home for my support through INHS. I also recently cycled off a 6-year stint on the ESA Common Names Committee, which has been a very enjoyable experience. Outside of academic life, our girls, Riley and Emma, recently turned two years old and add me to the book of parental clichés, I can't believe how fast they've grown!

Lincoln Taylor. I am a first-year Master's student in the Dr. Adam Dolezal's lab, and I am excited to round the end of my first semester of graduate school! Having done my undergraduate degree here at UIUC in the School of Integrative Biology, it is an exciting but strange feeling being on the 'other side' with a TA and research-focused perspective on school now. Adding to the strangeness was all the uncertainty regarding COVID-19. However, I was still able to have a successful field season studying how viruses can manipulate nursing behavior in honey bees.

Jonathan Tetlie. During the Fall semester of 2020, I completed my masters in the Harmon-Threatt lab, looking at the effects of the neonicotinoid clothianidin, on ground-nesting bees and beetle communities. I plan to continue working with clothianidin and the dynamics that it has on the prairie restoration process. Like many during this pandemic, my group hobbies, such as soccer, have fallen by the wayside. In that void, I have picked up disc golf and have continued to work on honing my skills in the kitchen.

M. Jared Thomas. The PRI Center for Paleontology received permission to move into the old INHS Library. New lab space is currently being constructed for us in our new home. This will be the first time all U of I paleontological collections will be housed in one location. Other exciting news for the paleo group was our ability to secure an NSF grant to conserve the Milton Sanderson Dominican Amber Collection. I had two publications in 2019, one of which was naming a new fossil pygmy grasshopper (Tetrigidae) after my wife and fellow U of I entomologist, Katie Dana. Hopefully I am still on track to graduate at the end of 2021, but COVID19 has really thrown a wrench in the works.

Annaliese Wargin. I recently started my first year as a grad student in the Harmon-Threatt lab working with native pollinators (during a global pandemic, no less!). My master's thesis, as part of the GEMS Biological Institute, will focus on the effects of anthropogenic change on legume-rhizobium mutualisms, and how those effects further impact plant-pollinator interactions between legumes and native bees. In the meantime, I'm in the process of wrapping up some work from undergrad, which focuses on the effects of barometric pressure change on the foraging behavior of bumble bees. Outside the lab, I enjoy reading, writing, cooking, and knitting. I'm excited to begin work on my thesis next year and hopefully see more of Urbana-Champaign!

Cariad Williams. I am a PhD student in Dr. Sam Heads' lab studying paleoentomology. My PhD thesis will focus on the arthropods found within Dominican Amber--specifically, the taxonomy and systematics of Platygastroidea, the taphonomic processes of Dominican Amber, and the paleoecology and paleoenvironment of Dominican Amber by examining the arthropod inclusions to family level. I adopted a new dog during quarantine. Her name is Kiara!

Sara Wilson. I am a first-year master's student in the Stone Lab at the INHS. This was an especially nerve-wracking year to start graduate school amid the pandemic, but I was so excited to continue working with mosquitoes after graduating this past spring. I spent much of this year collaborating with Dr. Stone and the Northwest Mosquito Abatement District, sampling diapausing mosquitoes from water reservoir tunnels in the Chicagoland area. I look forward to continuing my work with nectar-feeding mosquitoes.

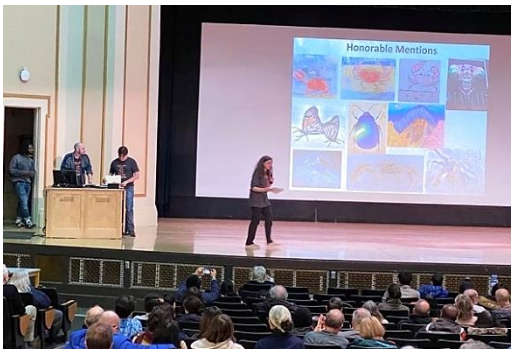
Wen-Yen Wu. I am a first-year Ph.D. student in Dr. May Berenbaum's laboratory. My current research focuses on the interactions between honey bee physiology and their dietary phytochemicals and microbiome. I am excited about our ongoing investigations on the in-hive fermentation and functions of honey bee ambrosia (bee bread), which seems well-known but full of mysteries. During my leisure time, I enjoy hiking in natural reserves and cycling.

RECENT GRADUATES

Graduation Term	Student	Degree	Thesis Title
May 2019	Rafael Achury Morales	PhD	Effects of Fragmentation and Invasion on Ant Communities (A. Suarez)
Aug. 2019	Nathalie Baena Bejarano	PhD	Systematics of Tridactyloidea (Orthoptera: Caelifera): Taxonomic Revision of Extinct Taxa with Comments on Extant Taxa (S. Heads)
	Mark Demkovich	PhD	Identifying Mechanisms of Pyrethroid Resistance in the Navel Orangeworm and Novel Methods of Control (M. Berenbaum)
	Tanya Josek	PhD	One Tick Closer to a Better Understanding of Tick Physiology and How to Incorporate Tick Biology in a Classroom (M. Alleyne)
	Allison Parker	PhD	Social and Ecological Risk Factors for Mosquito Production in Residential Neighborhoods (B. Allan)
	Kristen Reiter	MS	Micro- and Nanoscale Features of Insect Cuticle and Their Impacts on Wetting, Friction, and Optical Properties (M. Alleyne)
Dec 2019	Todd Johnson	PhD	Use of Sensory Information by Cerambycids and Their Natural Enemies to Locate Resources and Mates (L. Hanks)
May 2020	Edward Hsieh	MS	Ameliorative Effects of Phytochemical Ingestion on Viral Infection in Honey Bees (M. Berenbaum / A. Dolezal)
	Elijah Juma	PhD	Comparative Studies of the Microbial Composition and Diversity of Container-Dwelling Mosquitoes (J. Muturi / B. Allan)
Aug 2020	Corbyn Giers	PhD	Effects of Anthropogenic Change on Interactions Between North American Tephritid Flies and Their Biotic Associates (S. Berlocher)
	William Montag	MS	Investigating the Morphological Adaptations and Fungal Associations of the Small Hive Beetle, *Aethina Tumida* Murray (Coleoptera: Nitidulidae) (M. Berenbaum)
	Teresia Njoroge	PhD	Evaluation of the Role of Plant-Derived Chemicals in Mosquito Ecology and Control (M. Berenbaum)
Dec 2020	Daniel Pearlstein	MS	Effects of an Insecticide/Fungicide Mixture on Queen Rearing Behavior and Hypopharyngeal Gland Morphology in Honey Bees (*Apis mellifera* L.) (Hymenoptera: Apidae) (M. Berenbaum)
	Eric South	PhD	Molecular Phylogenetics of the North American Stoneflies (Insecta: Plecoptera), with Description of a New Species and Family (E. DeWalt)
	Jonathan Tetlie	MS	Evaluation of Native Bee Nesting Rates and Beetle Community Assemblages in the Presence of Clothianidin in the Soil of Natural Areas (A. Harmon-Threatt)

ENTOMOLOGY GRADUATE STUDENT ASSOCIATION

<u>2020-2021 Officers</u>
President: Scott Clem
Secretary: Annaliese Wargin
Treasurer: Sara Wilson
Webmaster: Will Montag
Outreach coordinators: Lizzie Bello, Ed Hsieh
Faculty liaison: Wen-Yen Wu
GSAC representative: Emily Struckhoff
Social Chair: Kat Coburn
NCB-ESA Student Affairs Representative: Jon Tetlie



2020 has been rough for the graduate students in EGSA, but our new class of officers is optimistic about 2021. While many decisions are yet to be made, we hope to hold the first ever 2021 Virtual Insect Fear Film Festival in February. Furthermore, the outreach program will continue offering year-round virtual live insect presentations upon request from interested groups. Pending whether COVID-19 restrictions are eased by summer, we hope to resume our participation in the annual C-U Pollinator Week in June. Finally, we are hopeful that we can plan safe social events and build friendships among graduate students for the coming year.

<u>2019-2020 Officers</u>
President: Brendan Morris
Secretary: Maggie Murphree
Treasurer: Evan Newman
Webmaster: Nick Anderson
Outreach Officers: Scott Clem, Ed Hsieh, Kylee Noel
Faculty Liaison: Jon Tetlie
GSAC Rep: Eric South
Social Chair: Cariad Williams
NCB-ESA Student Affairs Representative: Jacob Torres

The EGSA Outreach Program is alive and well. Since 2018 we've conducted at least 55 outreach presentations with live arthropods for various community programs, school groups, libraries, etc. This amounts to an estimated 189 hours of insect-related public outreach and extension, reaching 5,365 people of many demographics. While the amount of outreach has dropped during 2020 due to Covid-19, we have continued to serve virtually, reaching groups within the community and across the country.

36TH ANNUAL INSECT FEAR FILM FESTIVAL Foellinger Auditorium, February 23, 2019

Welcome to the 36th Annual Insect Fear Film Festival, continuing a tradition encompassing 83 feature films, 95 shorts, 35 t-shirts designs, 18,000 audience members and several hundred graduate students. This year, there were more than 370 art contest submissions, up 30 percent over last year. Long-distance travelers include festival stalwarts Nathan Schiff and Ellen Green, here from Stoneville, MS, alumnus Scott Shreve, and retired dermatologist Rick Walters, who comes regularly from St. Louis, MO. In honor of the festival, UIUC alumnus, Todd Hunter played an entire hour of insect-related music on WEFT on February 18, including The Cords "Termites" from That's Swift: Instrumentals from the Norman Petty Vaults (2007).

The financial crisis of 2007 led to downsizing in all sectors of the economy, so it was perhaps in solidarity that insect systematists decided to downsize the number of orders by moving termites out of their own order Isoptera and place them in the order Blattodea, along with the cockroaches. Actually, this wasn't the first time that termites have been moved around. For centuries, biologists haven't known what to do with the 3500+ species that at least superficially aren't quite like any other insects. There wasn't a name for them until 1849, when the word "termite" was coined; before that, they were known as "white ants". They're not ants, though. In the 19th century, they were tossed in with bark lice, stoneflies, and bird lice until 1904 systematics gave up and created a new order for them, which sufficed until 2007, when their biological resemblances to cockroaches became too obvious to ignore.

Irrespective of how entomologists classified them, the general public has been remarkably consistent over time in reviling them; in fact, "white ant" is probably the nicest thing they've been called. Despite the fact that they exhibit remarkably sophisticated social behavior, in contrast with the social hymenopterans they have failed to inspire motivational allegories or metaphors. What everyone does seem to know about them is that they eat wood, even though that "fact" is only partially true. A number of termite species do eat wood—40 billion dollars' worth of wood people around the world would prefer they leave alone. Americans spend $5 billion to get rid of and repair the damage caused by termites, with $1 billion directed against just one species, the Formosan subterranean termite *Coptotermes formosanus*. A typical colony, with a million individuals, can eat almost a pound of wood per day. Because the invasion of the USA by this non-native species has paused at 35 degrees N (eggs can't hatch at temperatures below 68 degrees F), Illinois is safe from them for the moment, but with global warming all bets for the future are off. Beyond wood, wood-eating termites also eat any products derived from wood and can uniquely cause economic damage by literally eating money (https://www.csmonitor.com/World/Latest-News-Wires/2011/0422/Termites-eat-millions-at-a-bank-in-India). Small wonder that termites are the metaphorical go-to group to disparage anyone perceived to have insidious destructive power. This insult has been hurled back and forth across every cultural and political gamut, including but not limited to Nazis, Jews, Muslims, liberals, members of the Trump administration, adulterers, and pedophiles. For the record, other than wood, other choice termite fare includes soil and mammal dung.

But you really have to give them credit—they were likely the first insects to have adopted advanced social living, between 100 million and 200 million years ago (with both a king and queen, who mate for life, unlike, e.g., certain European royal families). Admittedly, some of their social behaviors look peculiar from a human perspective—these include explosive defecation, phragmosis (blocking nest wall holes with an enlarged and reinforced head), and proctodeal feeding (anus-to-mouth food exchange). They also invented crop domestication, however; evidence of fungus-farming termites dates back 25 million years. Their engineering feats exceed human capabilities by orders of magnitude. Termites less than 1/12 inch in length can dig downward through the soil to reach the water table as far as 150 feet below the surface. Scaling up to human terms, that's the equivalent of digging a well more than 20 miles down. Last year, in Brazil, investigators reported finding 200 million regularly spaced mounds built 4000 years ago and still occupied covering an area in Brazil as large as all of Great Britain and visible from space (and involved excavating 10 cubic kilometers of soil, equivalent to what went into 4,000 pyramids of Giza). So-called "cathedral" termites, *Nasutitermes triodiae* in Australia build enormous mounts 25 feet high, making them "some of the tallest non-human animal structures in the world". Assuming a worker termite is about 1/12th of an inch in height, these mounds are equivalent to four stacked Dubai's Burj Khalifas. *2,722 ft.* (without cranes or other construction—mostly soil, saliva, and fecal material). They're a source of bioinspiration for construction and engineering--the Eastgate Centre building in Harare, Zimbabwe, uses a passive

ventilation system based on the design principles found in termite nests and uses only 35% of the energy required for temperature regulation in buildings of comparable size. The gut microbiome of termites is being explored for potential applications in lignocellulosic biofuel and renewable energy production; the zinc-reinforced mandibles of some species of Panamanian termites are so strong they can snap shut at 157 miles per hour without shattering.

Today, termites are probably essential to the planet's survival. Because termites turn up the soil, their mounds are used to prospect for mineral deposits such as gold, tin and kimberlite. By breaking down dead wood and dung, they promote soil fertility by restoring nutrients to the soil. Aside from soil fertility and nutrient cycling, they can pollinate—the subterranean orchid, *Rhizanthella gardneri*, an underground-blooming Australian orchid, is pollinated by Australian harvester termites in the genus *Drepanoterme*s. Moreover, they're food for 65 species of birds and 19 species of mammals, not to mention hundreds of other arthropods, and may have been responsible for our early survival as a species. At least 40 species of termites in four families are eaten directly or indirectly by humans, and 9 termite species are used medicinally across 29 countries on three continents. In Nigeria, one species is even used for "Spiritual protection against witches and wizards, rituals protection and promotion (in jobs, trade), appealing to gods and witches, soothsaying".

Oddly, however, despite a plausible argument that the planet depends on termites to function, a disproportionate number of our films suggest that termites don't even belong on Earth in the first place. For example, there's the 1952 Woody Woodpecker cartoon *Termites from Mars*, in which Earth is invaded by squadrons of alien termites who proceed to consume every available piece of furniture until Woody Woodpecker "turns the table" on them and dispatches them. In fact, their alien nature appears to have inspired our feature film (from SyFy TV) *Alien Apocalypse* (1995), which recounts an invasion of Earth by extraterrestrial termites who have consumed all wood supplies on their home planet and who enslave humans to harvest wood for them. I don't know the name of their planet of origin because, in the film, it is uttered only by the alien termites in an incomprehensible screech.

Alien Apocalypse is perhaps best defined by what it's not. It's not, for example, a good movie. It didn't make SYFYWire's "Top 30 alien invasion movies, ranked" list. It does, however, rank as number one on Internet Nerd Professor Rob Bricken's 2009 List of "The 10 Least Essential Works of Bruce Campbell". Chris Carle, giving the film a score of 1 out of ten, concluded his review with "Oh my god, can Bruce Campbell really have been this desperate?" Bruce Campbell is an American actor/producer/writer/director who is perhaps best known for his role as Ash Williams in the *Evil Dead* four-feature film franchise (beginning in 1978 and continuing through the Starz series Ash vs Evil Dead 2015-2018). In *Alien Apocalypse,* Campbell plays astronaut and osteopath Dr. Ivan Hood, who with his crew has been in a spaceship in cryo-sleep for 40 years. Upon returning to Earth. somewhere in the vicinity of Portland, Oregon, he and his crewmates learn belatedly of the alien termite takeover. Unlike vegetarian Earth termites, these aliens eat not only wood but also human heads and fingers. For some reason, this advanced extraterrestrial invasion force that can travel light-years through space, deploy neutron bombs and laser weapons, seems content to harvest wood using 19th century human technology (e.g., horses and handsaws). Ivan engineers a daring escape from subterranean slavery and sets off to locate the President of the United States, whom he finds hiding in the mountains along with some senators, evidently paralyzed by fear and/or apathy for a considerable length of time.

As for production notes, along with *Man with the Screaming Brain* (directed by Campbell as part of a two-picture deal with SyFy), *Alien Apocalypse* was directed by Josh Becker and costarred Renee Connor (both of whom were longtime friends of Campbell) and was filmed in Bulgaria, with Bulgarian crew and Bulgarian actors (few of whom spoke English, so a lot of the dialogue was added in post-production). Gary Jones, whom IFFF devotees may remember from *Mosquito* (1994) and others might know from *Evil Dead II*, created the CGI alien termites, which are recognizably insectan but which don't seem to have any body parts consistent with belonging to the infraorder Isoptera. They bear a passing resemblance to mantids, which as it turns out are related to termites, but that was probably just a lucky guess. With respect to the dialogue, there aren't many quotable lines; about the best might be what Dr. Hood says as he fires an arrow from a crossbow at an alien termite—"You like wood so much? Eat this!"

Reviews were "mixed"; in his review (https://filmblitz.org/alien-apocalypse-2005/), John McLennan offered "A memo to the makers; their use of the word "apocalypse" here creates unrealistic expectations, given almost the entire thing takes place around a single Oregon sawmill. 'Alien Skirmish' is a lot closer to the truth". Notwithstanding, the film premiered on SyFy to 2.7 million viewers, a ratings record-breaker at the time, and the DVD launched soon afterwards at 117 percent of projected sales. For the record, *Alien Apocalypse* is not Bruce Campbell's only insect-related work. He voiced the ant Fugax in *The Ant Bully* in 2006. Moreover, in an email

exchange, his agent, Barry K. McPherson mentioned, “you should American gothic episode. He is covered in beetles.” Evidently, agents are too busy to use verbs. As for the episode, if you’re interested in details, he played Lt. Drey of the State Police (and “victim’s brother-in-law”) in the episode “Meet the Beetles,” which aired 10/23/95 on CBS. I’ll try to locate a copy just in case there’s a future Bruce Campbell Insect Fear Film Festival in store…

Top: May and Hannah, with talking Jenga-playing termite: balloon termite; Josh Gibson and friends
Middle: Charles Dean and Daniel Bush sell t-shirts; Rachel Skinner and Dan Pearlstein explain insects; alumnus Scott Shreve stands out in the crowd; Hugh Robertson, Richard Leskosky, and Christina Nordholm
Bottom: Stewart Berlocher with alumni Ellen Green and Nathan Schiff; art competition entries; Jim Whitfield mingles with the crowd; Scott Clem demonstrates Bic pen trail-following behavior of termites

37TH ANNUAL INSECT FEAR FILM FESTIVAL Foellinger Auditorium, February 22, 2020

The 37th festival was our first devoted entirely to crustaceans. It was a homecoming of sorts for at least one in attendance. Lincoln Taylor, senior in LAS and prospective graduate student, had a long association with the festival even before applying to the entomology graduate program. As a native of Urbana-Champaign, Lincoln attended his first festival as a second grader; at the festival, he received a prize for his winning entry in the local school art competition (an illustration of an ant). As a senior undergraduate and prospective graduate student, Lincoln found himself on the other side of the festival, posting many of the entries in the art competition and helping with the exhibits (even volunteering to don a full lobster suit as he mingled in the crowd).

Our theme this year is "Crustaceans," which qualify as subjects for an insect fear film festival because molecular studies 15 years ago (Regier et al. 2005) demonstrated pretty conclusively that, despite the many un-insect aspects of their anatomy (including but not limited to having two pairs of antennae, biramous appendages (and more than six in their adult stages), no wings, odd free-swimming planktonic immature stages, and eyes that vary in number from zero to three), the 70,000 species of crustaceans in the world constitute the closest living relatives of insects.

Aside from morphology, the public at large only incidentally recognizes the relationship, naming some crustaceans after their more familiar insect relatives—e.g., whale lice (amphipods), fish lice (branchiurans), woodlice (isopods), sand fleas (hippid decapods and talitrid amphipods), water fleas (cladocerans), pillbugs (isopods), mantis shrimp (stomatopods), and (in Australia) Moreton Bay bugs and Balmain bugs (decapods). But one major difference in the cultural status of crustaceans compared with insects is that, for the most part, people appreciate them for their tastiness. Humans consume astonishing quantities of a remarkable variety of crustaceans—about 8 million tons every year. Moreover, crustaceans have been appreciated for their culinary value for a long time—the first archeological remnants of crustaceans for dinner date back 165,000 years, found in a cave off the coast of South Africa (Marean 2007). Crustaceans consumed by humans range in size from krill—small Euphausiacea present in every ocean in the world that top out at about two inches in length—to *Macrocheira kaempferi*, the Japanese spider crab, with a 12.5-foot leg-span and a body weight of 44 pounds or more.

Given that there are 14 times as many insects on Earth as there are crustaceans, with only 70,000 known species, it's not surprising that there aren't as many crustacean fear films as there are insect fear films. Compounding the problem is that there aren't many crustaceans that people fear (ruling out the fear of spilling their delicious meat or butter sauce on their clothes).

Perhaps unsurprisingly, our first short, *The Fresh Lobster*, initially released in 1928 and re-released 20 years later with sound, is about, what else, how delicious crustaceans are; the plot revolves around the strange nightmares that result from a late-night lobster meal (and that involve giant animated lobsters chasing the protagonist while he's still in an animated bed fleeing the nightmare lobster through town). Now's a good time to point out that "lobster" is not a very precise taxonomic term. There are at last four families called lobsters: Homaridae/Nephropsidae, the true lobsters; Palinuridae the spiny, furry, or rock lobsters (which lack the signature big claws); Scyllaridae the slipper, Spanish, or shovel lobsters; and Polychelidae, the deep-sea lobsters. Of these, only deep-sea lobsters aren't avidly eaten mostly because they live on the ocean floor, often at depths of 1600 feet. The human star of the short, Billy Bletcher, has a long history of working with, or as, arthropods; he provided a voice for the wartime short *Private Snafu vs Malaria Mike* (1944) and voiced a spider in two shorts: *Buddy's Bug Hunt* (1935) and *Bingo Crosbyana* (1936).

Our second short, from filmmaker Penny Lane, is basically a partially animated documentary about sea monkeys. *Just Add Water: The Story of The Amazing Sea-Monkeys*™ (2016) recounts the life of inventor, advertising genius, and generally peculiar Harold von Braunhut. Braunhut is best known for creating a hybrid brine shrimp (*Artemia* spp., and not true shrimp) and turning the tiny, almost transparent crustaceans into a national childhood obsession (not to mention inevitable disappointment when they turn out to be untrainable). The most peculiar part of the life of this holder of more than 190 patents (including X-Ray Spex) was his work as an arms dealer for the Ku Klux Klan and enthusiastic attendee and cross-lighter at the Aryan Nations World Congress.

Our first feature, *Attack of the Crab Monsters* (1957), was directed by Roger Corman, "King of the B movies," famous for producing hundreds of movies, only about 12 didn't make a profit. Our IFFF has showcased several of his insect fear films, including *Wasp Woman* (1959), *Brain Eater*s (1958), and his literal "bee" movie, *The Bees*

(1978). He also produced *The Navy vs the Night Monsters* (1966), a rare plant fear film (not to mention teen movies, biker movies, cowboy movies, nurse movies, women in prison movies, and car chase movies). Set on an uncharted atoll in the Pacific (actually, stock footage and footage shot at Marineland of the Pacific)—a team—a botanist, geologist, nuclear physicist, two biologists and a technician (anticipating interdisciplinary team science by decades)—is sent to investigate "frightening rumors about happenings way out beyond the laws of Nature". Immediately upon arrival, the sailor who drops the team off on the island falls into the water and is decapitated, presumably by a mutant crab. The actor playing the decapitated sailor was actually the screenwriter, Charles Griffin, a frequent collaborator with Corman. Things go downhill for the screenplay soon thereafter. Atomic testing has rendered the local crabs (or, at least two of them) into "a mass of liquid with permanent shape…any matter it eats will be assimilated into its body of solid energy; brain tissue is nothing but a storage house for electrical impulses—The crab can eat its victims' brains, absorbing his mind, intact and working". Moreover, the mutant crabs can speak to people with the voices of the people whose electrons they've absorbed, through metal objects, including but not limited to a gun and an ashtray. At times, they share some interesting facets of crab biology: "I can grow a new claw in a day but will you grow new lives when I've taken yours from you?"

Liberties were certainly taken by the filmmakers with crab morphology, not all of which can be blamed on mutation—in movies like these, pointing out inconsistencies is, well, pointless. Nonetheless:

--crab monsters evidently don't have eyestalks and their eyes have pupils. By the way, if you want to determine the age of a real crab, you can measure the rings on its eyestalks.

--also, at one point, Hank the technician designs a spring-loaded trap, explaining, "He has eight legs with which to step on the plate." Crabs are decapods, which is literally Latin for "ten legs".

--as do most movie monsters of the era, the giant crabs growl. Do crabs growl? Not exactly, but 30 genera of Brachyura have external sound-producing structures they can scrape together to make a rasping sound (stridulation), drum various body parts against the ground or each other, vibrate or bubble fluids from their mouths, vibrate appendages, or, in the case of ghost crabs *Ocypode quadrata*, really do growl, with their gastric mill (grinding teeth in their foregut).

The actor who played Hank Chapman was Russell Johnson, whose character at one point explains, "I'm no scientist, I'm a technician and a handyman." He's the one, e.g., who repairs the radio. This was good preparation for the role that probably defined his career—he was The Professor on Gilligan's Island, who was in fact a scientist who was capable of accomplishing almost any problems with materials at hand, except build a boat for leaving the island. In *Attack of the Crab Monster*, he is tasked with fixing the radio (but without the use of coconuts).

Our second feature, The Bay (2012), should have been rated "ARRR!" for gore. The filmmaker, Barry Levinson, is a respected Oscar-winner (Best Director for *Rain Man*), not something we can claim for most of the filmmakers associated with films at our festivals. The film is set on the shores of Chesapeake Bay, near where Levinson grew up (and still lives). The action takes place over a Fourth of July holiday in 2009, when mutating isopods exit the bay to eat revelers. These isopods acquired their mutations after being exposed to the pollutants that have accumulated in the Bay, including pesticides, hormones in chicken manure, and other sundry contaminants. In an interview, Levinson claimed that "Eighty five percent of the story is based on facts…In most cases we aren't making this stuff up" (https://www.huffpost.com/entry/barry-levinson-the-bay_n_2005249). That 85 percent estimate is generous, but there are facts involved; Chesapeake Bay is in fact "40 percent dead" due to pollution, e.g. The movie begins with an environmental mystery—a large fish kill. The story is conveyed by "found footage", pieced together by a clearly traumatized communications major at American University, Donna Thompson, covering her first story—the town of Claridge's annual Fourth of July crab festival of Claridge, a town where "Every girl's dream to be Miss Crustacean". Six weeks earlier, scientist/oceanographers from the Cousteau Institute and University of Maryland puzzled over strange developments; red algae indicating bacterial growth (probably from chicken industry runoff), along with mercury, Viagra, and endocrine disrupters. The toxins are following the current. The EPA continues to test the bay into which "45 million pounds of chicken shit dumped in the bay" and where a desalination plant was built to filter bay water so people could use it for the chicken industry. Soon—there's a lot of vomiting and bleeding and odd creatures leaping out of the water. Multiple hypotheses are discarded—*Vibrio vulnificus* bacteria, schistosomyiasis, cholera, maybe a fungal bacterium or a tapeworm, a small leak from a nuclear reactor a few years earlier are suspected as having something to do with the events. When the scientists realize that many of the dead people were found with "half their tongues gone," they think they've identified "the culprits"—mutated parasitic isopods, "One of the world's oldest creatures dates back to the Carboniferous period" [NOTE: yes, the oldest isopod fossils date back to the Carboniferous 300 million years ago but the oldest fossil of a parasitic isopod is *Urda*, only 168 million years old (i.e., Jurassic)]. As the research

scientist called in from University of Maryland to solve the mystery (sort of) explained, *Cymothoa exigua* is "a crustaceous isopod normally found in the Pacific. Last year they found a 2 ½ foot one trying to burrow into a submarine"; a new species has found its way into the Bay, mutated, and systematically began consuming local residents, perhaps condign retribution for all of those previous crab-eating festivals.

As for isopods, they're crustaceans in the class Malacostraca, along with the related amphipods. Most amphipods are marine and less than an inch long (other than the 30-cm super-giants found 7000 m deep in a deep-sea trench near New Zealand), but isopods are found in many more habitats, including moist terrestrial ones (such as the 4000 species of pillbugs, sowbugs, and woodlice). The 5000 marine species range in size from 0.0008 inch to the giant isopod (*Bathynomus giganteus)* topping out at 30 inches and weighing in at just under four pounds. Several are parasites, including most famously *Cymothoa exigua*, the ostensible inspiration for the plot of *The Bay;* this species consumes the tongue of its host, the spotted rose snapper, and then latches on and functionally serves as its new tongue. Like the man said, 85 percent real…In view of developments, the National Guard contains the town, while, primed by steroids, a "new form" of murderous tongue-eating lice is evolving. By the end of the film, virtually all of the central characters have died horrible deaths and a massive government cover-up attributes the chaos to "unusually high water temperatures." As for the 85% claim, about an hour into the film, the scientists consult an actual Wikipedia page, which may well be where Levinson got his inspiration and screenwriter Michael Wallach got his information. When I checked the page recently, there was no update about newly evolved species, but I still wouldn't recommend swimming in the Bay, if only because the chicken manure's still there.

ALUMNI NEWS

Rafael Achury Morales, PhD 2019. After graduation (May 2019) I came back to Colombia and then I moved to Germany (Feb 2020) to start a Postdoc in the Biodiversity Exploratories project.

Carol Anelli, MS 1982, PhD 1988. Life has been good! In July our son Walter Sheppard married the unflappable and talented Allyssa Turcotte in a small outdoor wedding at Steve's farm (Steve presided), with guests safely distanced and masked (this is saying something for Idaho). Having missed the last U of I Newsletter, I'll note that in September 2019 I completed 3+ years as interim department chair, during which stint I scaled a steep learning curve and gladly passed the baton to Jamie Strange (former chairs Dave Denlinger and Susan Fisher provided invaluable counsel, as did OSU Provost Bruce McPheron, all U of I alums). My teaching duties have increased, and as Autumn semester 2020 winds down the simultaneous instruction of classes in person and via Zoom has kept me hopping. Gardening in Ohio remains rewarding; every fall I experiment with various veggies to overwinter under hoops. COVID-19 meant cancelling my study abroad course on Darwin and evolution, but I'm hopeful for the future and meanwhile, I'm learning how to make pizza in my Ooni Karu pizza oven (google it!). Bill continues doing carpentry work, we've canned more jars than ever before, frozen what we didn't can, and managed to enjoy some good birdwatching. I wish everyone much happiness and good health-- let us know if your travels take you through Columbus!

Walter & Allyssa Sheppard

Andrew Chen, PhD 1976. I retired from the gainful employment at USDA-ARS in 2009. The retirement life has been fulfilling. I was always interested in playing with wood. After finishing building furniture for the house I picked up woodturning seriously in 1992. I got involved in World Wood Day (http://www.worldwoodday.org/) in 2014 and it has taken me to China, Turkey, Nepal, Cambodia, Laos and Austria. It was to be held in Tokyo this year but unfortunately, like many events it was cancelled due to COVID-19. I had two grandsons, aged 14 and 11 from my son and this past July my daughter also gave birth to a baby boy. Unfortunately, they all live ~1,000 miles away and we don't get to see them as much as we would like. I really enjoyed the online "mixer" last weekend. I was so glad to see many old friends besides May, like Joel Coats, Charlie Helm, Bruce McPherson, Diana Cox-Foster, Carol Anelli, Gene Kritsky and especially, Keith Solomon whom I had not seen since leaving Urbana. This is about the only positive thing coming out of the pandemic. I was saddened to learn at the mixer that Dan Strickman passed away back in March. He was our National Program Leader while I was at the USDA.

Eddie Hang Chio, PhD 1977 & Li-Chun Chio, PhD 1976. Entomology Newsletter Greetings from the Chio's family in Indianapolis. This is our update since Li retired from Eli Lilly in 2017. With plenty of time on our hand and our reasonable health, we travelled a lot since Li's retirement. 2018: Iceland, South America, Antarctica, England, Scotland, South Africa, Taiwan and China 2019: Egypt, Morocco, Amsterdam, Geithoorn, Croatia, Slovenia, Taiwan and China 2020: Australia and Taiwan. With the COVID-19 pandemic in 2020, we cancelled several Asian and European trips. Just like most of the Americans, we stayed home all the time since March. Hope the upcoming new drugs and vaccines can keep this terrible pandemic under control in 2021. In terms of Entomology related activities, Eddie taught "Insect pests control with insecticides" at several universities in Asian since his retirement in 2006. His most recent teaching was at the Central China Normal University at Wuhan,

China in 2018. Eddie also was invited to be the keynote speaker at the Nan Kai University centennial grand forum in 2019. The topic of his presentation was "Discovery of the Spinosad". Eddie also published a few bee keeping related articles at the beekeepers of Indiana newsletter; Beekeeping and bee products in China: An overview (2004). A new suspect in the Colony Collapse Disorder trial: The sub-lethal concentrations of neonicotinoids (2018). Chemical rotation for varroa control agents in beekeeping (2020). A personal note, we now have 4 grandchildren; 2 boys from our daughter and 1 boy and 1 girl from our son. That keeps us busy and happy. We live in Indianapolis and can be reached at 317/335-2133 or emails. Ehc13029@gmail.com or Lcchio@yahoo.com. Be healthy and happy. Keep in touch.

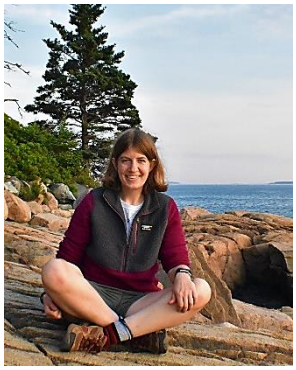
Scott Cinel, MS 2016. I'm completing dissertation research on predator-induced non-consumptive effects on stress physiology in corn earworm moths exposed to bat calls.

Joel Coats, PhD 1974. The past few years have been very good ones for us. I've continued to teach Insecticide Toxicology, Pesticides in the Environment, and Principles of Toxicology in the Department of Entomology at Iowa State University. My lab group moved into a brand-new building two years ago, and we are still conducting research on natural products as insecticides, repellents, and synergists, as well as various insecticides used in the agroecosystem that can impact pollinators, including bees and monarch butterflies. I graduated one Ph.D. this year, and still have 6 more grad students (4 Ph.D. and 2 M.S.) to finish up before I slow down. My group and I love the ESA and other conferences and hope 2021 will be better for the in-person conferences! My wife Becky, our 5 kids, and 13 grandkids also keep life interesting and rewarding. Hope to see you some of you in 2021!!

Ed Cupp, PhD 1969. Things continue to go well professionally. I remain a consultant to an NIH-funded research project in Uganda administered through the University of South Florida School of Public Health. We continue to make progress at both the basic and applied levels in developing a low cost trap to attract and catch the black fly (Simulium spp.) vectors of Onchocerca volvulus, the causative agent of "River Blindness". We recently found that infection with a common species of foot bacteria creates an array of sulfur compounds, one of which (tert-hexadecyl mercaptan) is highly attractive to female *Simulium damnosum*. It is now being used as an additive lure to the trap. I am also editing a training manual for the World Health Organization to be used in Africa. Its main goal is to train field-level entomologists to collect and evaluate data for assessment of river blindness elimination. I work with an international group of black fly experts from four continents – very exhilarating. The biggest news along the home front was the sale of the farm last Fall. We realized that keeping up with the farm and our other activities was extending us a little more than we wanted so we took action. We were able to harvest grapes from two seasons and still have fond memories of being in Nature on an almost daily basis. A great experience. Best wishes to all.

David Denlinger, PhD 1971. I think I decided to retire at the right time. My heart goes out to all who are busy maintaining teaching and research programs during these trying times. I can only imagine how challenging that must be. After retiring from Ohio State a few years ago, we moved back to our family farm near Bird-in-Hand, Pennsylvania. Our son and family live in the old farm house and we live across the lawn in an old barn that we converted into a house! We take delight in being so close to our grandchildren. When not distracted with activities on the farm I chip away at a book on diapause. It was due to Cambridge University Press in November, but I'm running a bit late. The International Centre of Insect Physiology and Ecology in Nairobi is celebrating its 50-year anniversary this year. As one of the first scientists to join that enterprise, I was looking forward to returning to Kenya for the anniversary celebration, but, as with so

many other activities during this COVID era, I will be participating only through zoom. My years and Illinois and the wonderful mentoring I received there remain a treasured memory.



Allison Gardner, PhD 2016. It's hard to believe that it's been almost five years since I graduated from UIUC! Since 2016, I've been an Assistant Professor in the School of Biology and Ecology at the University of Maine – pretty much the perfect place for a medical entomologist, between the incessant mosquitoes (the "Maine state bird") and the expanding northern range of the blacklegged tick. I've enjoyed exploring the interesting rock pool and tree hole mosquito communities in rural Maine and continuing to study mosquito ecology in stormwater systems. My first foray into tick research has been a big professional transition for me, not least because I am unabashedly terrified of handling rodents, but I've been lucky to work with a great group of undergraduate and graduate students who are very enthusiastic about counting tick larvae on mice despite my misgivings about any animals with vertebrae! I'm teaching a 300-level undergraduate General Entomology course, which routinely features research led by my former classmates and professors, and a senior capstone course on Emerging Infectious Diseases, which has proven all too relevant over the past year. On the personal side, I live an hour away from Acadia National Park (see photo) and spend almost every weekend hiking, and in July 2019 I became a homeowner here in Orono. Sharing all my adventures is my partner of nine years, Brandon Lieberthal, a fellow Illini (PhD 2015, Theoretical and Applied Mechanics) and a Lecturer in the Department of Mathematics at UMaine. Thanks to my graduate advisors, Brian Allan and Juma Muturi, for their mentorship that helped me realize a career that brings me so much joy!

Tugrul Giray, MS 1990, PhD 1997. Greetings and best wishes to all of U of I Entomology in 2021! I really look forward to the newsletter both to share our news and to hear from you. Clara and I are now almost empty nesters with my daughter and son attending out of state universities. In the science front, if success is measured in transmitting "memes" our lab is doing very well. Our alumni have research programs and labs in different countries and institutions on honey bees and social insects. Most recently Arian Avalos began his research at USDA-ARS in Baton Rouge. Currently Yarira Ortiz-Alvarado is looking to move to Europe to study social insects. I just got my first academic grandson to come to my lab from Devrim Oskay's group in Turkey. Likewise, we just published an article on drone congregation areas with a student of Alberto Galindo in Argentina. I do wish happy, healthy (after winning against COVID 19), productive days to you all.

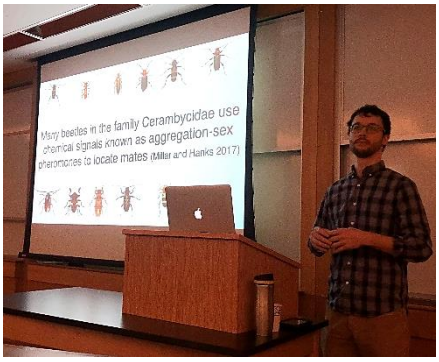
Tyler Hedlund, MS 2015. After wrapping up my MS in 2015, I bounced around various labs and projects at UIUC/INHS before joining the ranks of UIUC alums in USDA-APHIS-PPQ as Area Identifiers in 2017. I'm based out of Laredo in south Texas, where I identify and help make quarantine decisions on insects intercepted with cargo coming across from Mexico. It's a job that requires quite a bit of flexibility and being able to think on your toes as we deal with daily deadlines and we never really know what will be in the vials the CBP Agriculture Specialists submit. Maybe I'm lucky and it's a grasshopper or katydid. Maybe I'm unlucky and it's a decrepit moth with no scales. There's a mystery waiting in every envelope!

In 2018, my then fiancé, Jocelyn, and I came back to Chambana for too short of a visit to get married and visit our favorite parks and good old Curtis Apple Orchard (it's incredible how much you miss stuff like that!). Jocelyn finished her stint as a manager at a local Panda Express in 2019 and is on the final steps to get her Texas teaching certification.

When not in the office, I'm out birding, insect collecting, or hiking around somewhere, either with Jocelyn or a couple of my collecting buddies. The bug hunt has taken me all over Texas, where we've worked together to rack up county, state, and a couple possible country records. It certainly keeps things interesting!

Tess Henn Mondello, MS 1989. Forestry Inspector for the City of Indianapolis, Indiana.

Todd Johnson, PhD 2019. Hello everyone! It's hard to believe that over a year has passed since I left the department in a whirlwind last May for New Hampshire. I am currently in my second of three years as a postdoctoral research associate in Jeff Garnas' forest ecology lab at the University of New Hampshire, Durham. My role in the Garnas lab has been to lead a USDA funded project studying the role of ontogeny (i.e., traits associated with development) on interactions between two species of ash, the invasive emerald ash borer, and two species of biological control agents of the beetle. We are specifically looking at 1) how the constitutive and induced defensive chemistry of ash phloem differs across four size classes of green and white ash, and changes after artificial infestation with eggs of the emerald ash borer, or induction with methyl jasmonate (simulated attack), and 2) Impacts of tree species and size class on the behavior and fitness of larval emerald ash borer, and how these changes may affect rates of parasitism by biological control agents. If folks are interested in more of the details, an overview of the project as well as several recent research updates are available on the website of one of our field sites, Doe Farm (https://www.ci.durham.nh.us/boc_conservation/doe-farm). This project has been largely field based and I have been enjoying the opportunity to spend lots of time poking around in New Hampshire's beautiful forests. In other news, I still have been working towards publishing the remaining chapters of my dissertation. My second chapter, where I report on response by a number of species of parasitoids to the aggregation-sex pheromones of cerambycid beetles, is currently in revision and will hopefully be published before the end of 2020. The third chapter on response by natural enemies to the aggregation-sex pheromone of the cerambycid *Xylotrechus colonus* will be submitted in 2021 along with a side project of mine looking at the alarm behavior of two species of *Camponotus* and the potential for interactions between ants and cerambycids. As I near the completion of the second year of my post-doc I have been looking into new postdoctoral positions and applying to university jobs, hoping to continue my work on the behavioral and chemical ecology of forest insects. Hopefully by the next update I will be able to report good news! Lastly, I hope all is well with folks at Illinois and beyond. I look forward to catching up with everyone the next time it's safe to attend conferences. Cheers! -Todd



Gail Kampmeier, MS 1984. It's now been more than 10 years since I retired from the Illinois Natural History Survey but this year marked my joining INHS as an Affiliate. While 2019 now seems so long ago, with cherished memories of being on the program committee and attending Biodiversity Next https://biodiversitynext.org/ in Leiden, NL (photo with Connie Rinaldo at GBIF dinner in Pieterskerk), 2020 found us scrambling to conceive and execute a virtual conference for TDWG 2020 https://www.tdwg.org/conferences/2020/. Of necessity, many of us on the Biodiversity Information Standards (TDWG) Exec learned the finer points of Zoom, Slack, Eventbrite, YouTube, SurveyMonkey, TimeandDate, Pensoft's ARPHA Writing Tool, and Google Drive. Time zones provided a continuing challenge not only for scheduling sessions but for weekly planning meetings stretching from San Francisco to Melbourne, Australia, barely contained on a single day. It took a village. In 2019, I was part of a team submitting and participating in a successful Program Symposium "Advocating Diversity Among Entomologists: If Insects are diverse, we should be too!" at the Entomological Society of America conference in St. Louis, MO. In 2020, EntSoc and the Entomological Collections Network conferences are going virtual as well. Virtual events present opportunities for reaching and engaging a broader audience than could normally attend an in-person conference, but generating successful networking opportunities will need a lot more imagination and persistence to solve.

Aron Katz, MS 2010, PhD 2016. I moved to Champaign and joined the department in 2010 as a graduate student, with the intention of getting my MS degree and moving out of the Midwest. Fast-forward 10 years: I'm still in Champaign; decided to stay and get my PhD in Entomology; married my amazing wife, Monique DuBray; had a beautiful baby girl, Samantha Zoey Katz; bought my first house; and accepted my first post-graduate position as a Research Biologist at the Construction Engineering Research Laboratory (CERL) in Champaign. I didn't think I would still be in Chambana in 2020, but I'm very grateful to still be here! As part of an exceptional research team at CERL, I am able to pursue many exciting directions of molecular genetics research including: phylogeography and population genetics of glass lizards, cicadas, and turtles; differential genetic expression in monarchs; metabarcoding tick microbiomes, herpetofaunal communities, and snake fungal disease; and environmental DNA analysis to survey at risk species such as the Louisiana Pinesnake, groundwater amphipods, freshwater mussels, and of course, cave springtails! Furthermore, I've been fortunate enough to maintain many relationships and productive collaborations with the incredible researchers, graduate students, and alumni of the Entomology department and the Illinois Natural History Survey. With 2020 nearly behind us, I'm looking forward to our future collaborative research efforts!

One-year old daughter, Samantha

Don Kuhlman, PhD 1970. I received my PhD in 1970 at the U of I. Great professors ! An icon, Bill Horsfall, brings back memories…good ones.

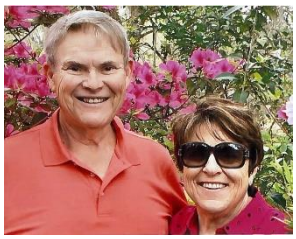
I'm a professor emeritus in the College of ACES at the U of I…retiring in 1991, then taking a 2-year assignment in Peshawar, Pakistan on a project to help transform an agricultural university in the Northwest Frontier Province. Great experience. Happy memories. Since 1994 I did some consulting work and Donna and I , did lots of traveling around the world. She passed away in December 2017 and I moved from Champaign to Chandler, AZ, to be close to our sons.

I still follow Illini football and basketball. Go Illini!

Richard Lipsey, PhD 1972. The month I graduated under Dr. Robert L. Metcalf, the Bayer Chem. Corp. hired me to be regional R&D mgr. for the mid-west. I then got hired by the Univ. of Florida to teach pesticide toxicology and asked Dr. Herb Nigg, also class of 1972 under Dr. Metcalf, to assist. He was running the Fla. Citrus Res. Sta. in pesticide development in Lk Alfred, FL. for the Univ. of Florida (retired). I was the Florida State-wide Pesticide Coordinator and consulting for EPA, the State Dept. and USDA in Wash, DC.

I then consulted for several US agencies world-wide as a toxicologist and went to 96 countries speaking 5 languages incl. Russian, Chinese, Indonesian, etc.: picked up by soviet troops in Cairo before the "Six Day War" and had no passport (or visa) but escaped by cursing them out in Russian. I also was undercover in Mogadishu, Somalia before we invaded ("Black Hawk Down") and escaped to Nairobi. I then refused an agency assignment to infiltrate Rhodesia the night before it became Zimbabwe, but watched the invasion of Mogadishu from Mombasa, Kenya. Finally, I went into forensic toxicology as an expert witness in poisons, or toxicology, testifying in about 80 cases a year nationwide and internationally (Bhopal India, Ed McMahon Hollywood mold case, Exxon Valdez, etc.). Now, I am 82 and retired in Jax, FL. and "living happily ever after."

Chris Maier, PhD 1977. My biggest news is that I retired in May 2019 after 42 years at the Connecticut Agricultural Experiment Station. As an emeritus, I still have an office and laboratory where hopefully I can complete some long overdue papers on cerambycids, syrphids, periodical cicadas, and invasive insects. The lack of precise deadlines allows ample time for wandering the forests and the wetlands of New England to seek rare syrphids, tabanids, and other unusual flies that have alluded me in the past. My wife Marie, also retired, continues to create mosaic art, her passion for the last 20 years. The only other non-holiday occupant in our house is an old, untrained golden retriever, who enjoys the hobby of emptying our waste baskets and spreading the contents around our house.



Mark McClure, MS 1973, PhD 1975. I live with my wife, Laura, of 48 years in coastal South Carolina. We enjoy travelling the world and visiting our three grandchildren in Connecticut. We love the beauty and warmth of South Carolina after moving here from New England 14 years ago. We hold fond memories of our four years in Champaign/Urbana.

McGuire, Mickey_PhD 1985. I have been busier in retirement than I was working for the USDA-ARS. I volunteered for almost 5 years as Vice President, then President of the Rocky Mountain Flycasters, a 1,000+ member Chapter of Trout Unlimited, a national conservation organization, but will be stepping back a bit to focus on other things. I also serve on the Board of Directors for the Big Thompson Watershed Coalition which helps preserve and restore riparian and wildlands areas in the Big Thompson River in Northern Colorado. While not volunteering, I enjoy fly fishing, travelling (England, South Africa and Mexico over the past three years) and simply enjoying the Rocky Mountains.

Duane McKenna, MS 2000. My wife Kate and I have 4 busy, fantastic children, ages 16, 14, 12, and 9. Over the last 2 years, a large fraction of my time has been spent establishing the Center for Biodiversity Research at the University of Memphis (www.umbiodiversity.org). My lab keeps busy studying the phylogeny and evolution of beetles and other insects with a focus on insect-plant interactions, diversity and endemism, and the evolution and genomic basis of plant-feeding.

Katelyn Michelini, MS 2008. It has been my great pleasure to work as a Senior Field Applications Scientist at Illumina since 2013. I live and breathe all things sequencing related. I genuinely love supporting my Chicagoland customers. My focus is working with end-users to train them on our instrumentation, sequencing techniques, and troubleshoot when issues arise. There are no two days exactly alike, which provides a nice change of pace every week. We welcomed our daughter, Liberty Joy, in June 2018. She is a happy, funny, and smart little girl. 2020 has definitely been interesting thus far, and my husband and I joke the best thing to come of this year is our son, Lincoln Frederick. Lincoln is the happiest of babies. We are enjoying our additional family time and less traveling for work.

Peter Price, faculty member from 1971 to 1979. I have now been retired for 18 years, a state I recommend to all. I greatly enjoyed the last Entomology Newsletter 2017-2018: the colorful images and alumni news provided a rich profile of all that the Department has fostered, yeah, over these many years. I was a faculty member from 1971 to 1979, so I overlapped with many whose reports appear in the Newsletter.

The current epidemic brought to a close my volunteering at the Museum of Northern Arizona earlier this year, and lead to the cancellation of all our travel plans. Hence, I have much more time to potter in our greenhouse (pictured), and to garden. Growing plants is a tranquilizing past-time for me: plants are lovely, colorful, quiet, non-argumentative, and grow and flower as best they are able.

Last year Gary Alpert and I worked on a paper about the Arroyo Willow Stem-Galling Sawfly, *Euura lasiolepis*, which is now published (Amer. Entomol. Summer 2020:34-39): probably my last publication.

Maureen and I enjoy hiking in the Ponderosa Pine forest around Flagstaff, usually twice a week, covering 10-12 miles when we are feeling energetic. Black bear, deer and elk make appearances along the trails if we are lucky.

Greetings and good wishes to all!

Ann Ray, MS 2005, PhD 2009. I am still an associate professor in the Department of Biology at Xavier University in Cincinnati, teaching 3-4 courses a semester, and maintaining a modest research program. In Spring 2019, I was rewarded for my hard work with more work, and I was appointed as the advising coordinator for our department of ~500 students. They tell me this will look good when I apply for promotion.

Invasive insect species continue to arrive and spread, and there's no shortage of work to be done. I continue my collaborations with USDA-APHIS Otis lab, working on any and all sorts of invasives: wood borers intercepted in port facilities, invasive tingids and leafhoppers (with Chris Dietrich, Suni Krishnankutty, and Jamie Zahniser), Asian longhorned beetle and velvet longhorned beetle, emerald ash borer (co-advising a graduate student with Matt Ginzel), and, most recently, spotted lanternfly. I have a wonderful lab manager, Emily Franzen, and 4-6 undergraduate research students each summer. Over the past few years, we have sent a number of Xavier students onto graduate work in entomology and closely allied fields. Travel for field work didn't happen in 2020, but in Summer 2019, I spent a month in Corsica trapping velvet longhorned beetle and *Rosalia alpina*…well, trying to trap them.

I got married in March 2020, just days before the world shut down, and in June we added a yellow mutt named Darwin to our family.

Hilary Reno, MS 1998, PhD 2000. I'm now an Associate Professor of Medicine and still at Wash U in St. Louis with a continued focus on sexual health (STIs and HIV). My research in health services science (the quality and equity of care for STIs) continues as does successful collaborations with basic researchers (with a paper in the NEJM--a feat unlikely to be equaled in my career). I've worked for the CDC, Division of STD Prevention for 50% of my appointment for 5 years now, I am the medical director of the St. Louis STI/ HIV Prevention Training Center, and I am medical director of the St. Louis County Sexual Health Clinic (for 13 years). This year has been upended with the pandemic, and I'd have to say that the Spring was challenging beyond any of our experiences in medicine.

Shaun, Ian (14), and Kieran (10) remain healthy and happy. Virtual school for all of them has given us a lot of time together. We miss traveling but made a road trip to Montana this summer, distancing the whole trip.

Thomas Schmeelk, MS 2015. Although COVID stopped many tourists from visiting "vacationland" this summer the forest pests of Maine didn't seem to get the memo. I'm still gainfully employed as an entomologist with the Maine Forest service and received my first federal grant to supplement the work I've been doing with browntail moth. I became a new uncle about a year ago and try to visit my newly walking niece often. I think of my U of I family often and hope you're all doing well during these strange times.

Mike Cohen and Alan Schroeder in Montreal

Alan Schroeder, PhD 1990. "Keep moving" my maternal Grandma used to say. "Good food is the most important thing in life" my paternal Grandpa used to say. So, I followed both of their advice. Travel widely and eat well. At more than 100 countries, but not counting, I've been fortunate to do both. Those who remember me from our graduate student days will recall that I talked enthusiastically about making a career working internationally in applied agricultural entomology. Well, with persistence and a bit of luck, I did it. My UI entomology degree and IPM training shined a light on the path forward for my most unusual of careers. The pandemic caught me in early February traveling by road through the five northern states of Burma, one of a select group of foreigners permitted to do so as part of a technical mission to bring integrated pest and disease management and agribusiness expertise to farmers, extension workers and agricultural input suppliers. That part of Burma had been embroiled in ethnic conflicts for decades since WWII, and foreigners were not allowed in, mostly for their own safety. Now, instead of worrying about restive hilltribe folks, I was more worried about our proximity to Wuhan. We jumped with every cough we heard. Our mission began with handshakes with everyone we met

(followed up with hand sanitizer). By the end of our mission, everyone was doing a polite short-distance bow instead. Luckily, Burma has not been hit too hard by the pandemic. After four weeks of fun in the hills (and restaurants) of Burma, I was to fly out back through Seoul. Seeing the spike in coronavirus cases in South Korea a week before my early March departure, I changed flights to come back through Doha instead. The night of my departure I wandered by the Korean Airlines check-in to have a look—all flights to Seoul cancelled!! Wow, good decision on my part or I might still be there eating all those exotic tasty foods and enjoying nice weather with very polite Buddhist people. Living in the countryside surrounded by nature as a kid, helping my Dad and brother grow every fruit and vegetable crop possible in the temperate upstate NY climate, raising chickens and ducks and watching my Mom prepare all of those into incredible meals and baked goods got me off to a good start with agriculture and food. At one point I stood in my Dad's oversized gardens and orchards and thought: Wouldn't it be cool to work on exotic crops all over the world. Well, be careful what you dream for, it might come true. Along the way I taught myself to cook well, gained a bunch of diverse friends and learned Spanish, French and some Russian. I also got a pilot license and learned how to fly airplanes. My travel has taken me to the heart of Africa and all its extremities—some 40 out of 54 countries—working on agriculture research projects, IPM and locust plague management. It has taken me to remote corners of Borneo, Sulawesi, Papua, Bangladesh, Nepal, most of the "Holy Lands", new pieces of the former Yugoslavia, all of the Caucasus as well as four of the five "Stans" of Central Asia—all places that I could only dream of as a kid—sometimes called parts unknown, never imagining that I would actually get there one day. Who would have ever thought that a PhD degree in entomology could be stretched so far (well, an executive MBA along the way—inspired by my buddy and classmate Hengchen Lin—helped)! Now that the coronavirus has clipped my travel wings, I focus on composting and growing some of my own veggies, cooking, reading, continuing my Transcendental Meditation practice, going for long brisk walks in the woods, movie watching, researching and writing a few remote consulting reports for pocket change and ever perfecting my martial arts training in Chen style Taijiquan. Best wishes to all entomology graduates for fulfilling their dreams with an awesome degree from an awesome department. Dream big.

Alan in Papaua

Alan and his emissaries in Samarkand

David Schultz, MS 1997, PhD 2001. Greetings from Missouri! It has been quite a while since I have updated my home department at Illinois, with apologies. After finishing at Illinois in 2001, my wife Laura (Clamon) Schulz and I did post-docs in the Boston area (mine at Brandeis Univ., Laura's at BU) before coming back to the Midwest and the University of Missouri in Columbia, MO in 2005. My work focuses on neural circuits and neural plasticity and I didn't stray too far from my entomological roots but did add some appendages to the model system – we largely use decapod crustaceans in this work. Since coming to Mizzou I have moved steadily forward, and am now a Professor of Biological Sciences and as of July 2020 I am the new Director of the Division of Biological Sciences. Beyond crustaceans and a deep love for integrative biology, I have also moved half of my lab into model systems that let me employ the same basic research perspective to neural circuit plasticity in mammalian models of spinal cord injury and Multiple Sclerosis. As a result, I am also the Faculty Research Lead in Neuroscience for a new Precision Health initiative that is being built on the Mizzou campus, complete with a new "state of the art" (as they say) research building and lots of other investments that keep me busy. Not a day goes by when I don't harken all of this back to my days at Illinois, and the community in the Entomology dept. It was a gift to do my work there, and with the contemporaries that I was exceptionally lucky to have. When we're not battling pandemics and despots, it would be a pleasure to make it to another IFFF and get a chance to see what's new about Morrill Hall!

Michael Slamecka, MS 1999. Been at the same job now for almost 2 decades—biologist at South Cook County Mosquito Abatement District.

Christina Swanson (Silliman), MS 2014. I have run the SIB Career Connections and Alumni Mentoring Programs since I graduated with my second MS in Science Education in 2017. Shameless plug: if you would like to stay connected to Integrative Biology, either as a mentor or by participating in the services and events we offer, please reach out at sillima2@illinois.edu.

Daniel Swanson and I now have adorable twin two-year-old girls, Riley and Emily. We are proud to report that they love bugs, though being toddlers insects don't always escape from their "loving" clutches unscathed.

Family picture at Mt. Ranier

Michael Toliver, PhD 1979. I've been retired from my position at Eureka College for 5 years now. We moved to Normal in 2016. At Eureka, I taught General Biology (for non-majors) Principles of Biology I and II (for majors), Evolution for Everyone, Botany, Zoology, Animal Behavior, Ecology, Evolution (Advanced), Science and Math seminar, Methods of Science (required of all students), Western Civilization (2 courses; in the "modern" section I talked about my time in Viet Nam [as part of the "decolonization" segment] among other things), Ethics (The Good Place came in handy!) and probably some I'm forgetting. Lots of teaching (I did all the labs as well - no teaching assistants although I did have students help me set up labs)! Retirement has allowed me to do more with bugs than I was able to do while teaching at a small liberal arts college! I was also division chair of Math and Science (twice!) and the first President of the Faculty. At one point I was president of our AAUP chapter. I recently "retired" as Secretary of the Lepidopterists' Society, a position I held for nine years. Before that, I was on the executive council and I edited the Journal for 3 years. I was one of the Lepidoptera editors for Zootaxa as well. I recently published an article on *Euchloe olympia* in the Journal of the Lepidopterists' Society, and I'm working on one on Batesian Mimicry with Mike Jeffords for future publication. Mike and I are also working on a revision of the Illinois Skipper book. In addition to that, I've been posting "butterfly of the day" and other "critters of the day" on Facebook. Peg is not retired, and is still layout editor for the Journal of the Lepidopterists' Society. Family-wise, we're adjusting to having a daughter living far away in Atlanta, GA. She and her husband Nick just bought their first house. We try to get out to the prairie and/or woods around Normal every day where we both take photographs. Peg and I recently celebrated our 40th anniversary and look back on the photos taken on that fateful day (June, 1980 -it was hot) when so many of our friends from the Entomology department were there.

Art Weis, PhD 1981. Hello to all my old friends from Champaign-Urbana. This is my 14th year at the University of Toronto. I moved up here in 2007, after nearly 20 years at the University of California-Irvine, to take the directorship of the Koffler Scientific Reserve. This 880-acre facility is a great place for both observational studies and manipulative field experiments, and its conveniently located just 35 miles north of campus. Some of my other responsibilities have included directorship of the Canadian Institute of Ecology and Evolution, a center sponsoring working groups that review and synthesize disparate findings from our field of study. I stepped away from those posts a few years ago and now am back to full-time professoring in the Department of Ecology and Evolutionary Biology. My research focus has shifted from insect-plant interactions to a primarily plant focus, including work that demonstrated rapid evolutionary responses to climate change. Retirement is on the horizon, but not until I do one more sabbatical in the south of France (Université Montpellier), next year.

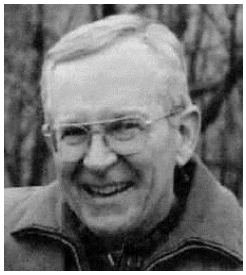
Jean and I were married in 2012, and we live in the oldtown section of Newmarket, just a 10-minute walk to the train down to campus, and a 10-minute drive to the Reserve. We have a big vegetable garden that manages to feed a whole lot of pests. My sons live in Portland, Oregon and Santa Barbara, California, so we don't get to see them, or the grandkids, as much as we would like. But we are proud of the men they have become.

Joseph Wong, MS 2011, PhD 2016. Entomologist for USDA_APHIS_PPQ in El Segundo, California.

OBITUARIES

Dr. Robert Wayne "Bert" Clegern, PhD 1972, Colonel, USAF, BSC, Ret. 1943-2018
[Email from Dr. Keith R. Solomon, PhD 1973, Fellow ATS, Fellow SETAC, Prof. Emeritus, University of Guelph, Canada:

"*Bert (Robert) Clegern died of a myocardial infarction on March 10, 2018 in Cantonsville, Maryland. Before that he was in good health and in fine spirit so it was unexpected. His memorial service was held on April 21, 2018 and attended by over 200 people. After retiring from the US Military he taught in colleges and schools, traveled widely across North America with his wife (Linda) and dabbled in the antique business. He and Linda moved into a retirement complex just outside Catonsville several years ago where immediately became involved in several community activities. He had a great sense of humor and regularly sent out emails with assortments of jokes and funny stories. I, for one, looked forward to these missives and they made my day. I know that all who knew Bert will miss him. He was a great entomologist, teacher, social activist, and above all, a real gentleman.*"]



In Memoriam: Robert Wayne "Bert" Clegern was born in San Diego, California on February 28, 1943, and grew up in Littleton, Colorado. He completed a BA degree at the University of Colorado in 1965, and an MS degree in entomology at the University of Illinois in 1966, after which he accepted a commission in the US Air Force as an aviation physiologist, and served at Vance Air Force Base, Enid, Oklahoma. Even though busily employed in non-entomological work, he reported to his alma mater's newsletter editor that he was "keeping his eyes and net open for Oklahoma insects to add to his collection, and he hopes to do some basic research on the effects of high altitude on *Tribolium confusum*." In 1969, he competed for and won a US Public Health-funded assignment to work on a PhD degree, which he completed in entomology under Dr. Robert Metcalf at the University of Illinois, graduating in 1972. His first assignment as an Air Force entomologist was to the USAF Environmental Health Laboratory, Kelly Air Force Base in San Antonio, Texas, followed by a tour with the Epidemiology Division of the USAF School of Aerospace Medicine at Brooks Air Force Base, also in San Antonio, during which he completed landmark ecological and biological work in places as diverse as the panhandle of Florida and the Phoenix Islands in the Central Pacific Ocean. In 1978 he took an overseas assignment as Command Entomologist for US Air Forces Europe, headquartered at Ramstein Air Base, Germany, responsible for pest management programs at some 39 installations in 14 countries at locations ranging from above the Arctic Circle in the north to North Africa in the south and from England in the west to Turkey in the east. During his tour of duty he produced such comprehensive biological surveys of the installations he visited that his successors used them as the "gold standard" for decades. He returned to the States in 1982 to join the staff of the Armed Forces Pest Management Board (AFPMB) in Silver Spring, MD, and moved up through the organization to its highest position, Executive Secretary of the Board. His tenure was marked by a series of challenges resulting from evolving environmental and defense policies that necessitated changes in Department of Defense (DoD) policy and guidance. The timing was perfect for Bert, whose passion for the environment and fervor for force health protection were firmly supported by commanding leadership skills and highly developed reasoning and writing abilities. In addition, from 1983 to 1987, he served as the Associate Chief of the Air Force's Biomedical Sciences Corps and Consultant to the USAF Surgeon General for Medical Entomology, guiding Air Force-wide medical entomology programs and the accessioning of new entomologists into the force. In 1988, he was selected by the American Registry of Professional Entomologists as the Outstanding Entomologist in the category of medical veterinary, urban, and industrial entomology. In 1992 he moved to Gainesville, Florida, to serve as the DoD Research Liaison Officer for the AFPMB, with duty at the USDA's Medical and Veterinary Entomology Research Laboratory on the campus of the University of Florida. After a little over a year at the lab, he retired from active duty in 1993 at the rank of Colonel, and after a short period of work as a contractor bridging the gap until the arrival of his replacement, he moved to Texas to teach at Austin Community College, a job that included excursions to the Big Thicket of East Texas. In 1996, he moved to Maryland and married Linda (née Ramsey) Fink, who had been his secretary when he was the Executive Secretary of the Armed Forces Pest Management Board, and continued teaching as an adjunct assistant professor at the University of Maryland University College. Even well into his retirement years he remained exceptionally active, teaching environmental topics in the local Elderhostel program, playing on and coaching the senior ("read slow motion," he noted) softball team, chairing the residents'

Grounds Committee, and traveling whenever possible, including trips to the Maritimes, west Texas, the Lesser Antilles, southern California, Albuquerque, the Berkshires, Costa Rica, Mexico, eastern Canada, Key West, the Rockies and the northwest. In 2016 he was inducted into the Maryland Senior Citizens Hall of Fame in recognition of his work with (among others) his retirement community's Nature Trail Committee and the Rotary Club of Catonsville Book Collection. Many of Bert's colleagues will remember his collection of toilet paper, which he began during his overseas travels as a humorous way to bring out points about sanitation standards in the far-flung places where US troops live and work. He is also noted for his collection of vintage hand tools, many of which he donated to the Duvall Tool Museum in Maryland, and his skills in restoring antiques, which fit well with his and Linda's restoration of a 160-year-old house in Elkridge, Maryland. In 2010, Bert and Linda "downsized" to a retirement community in Catonsville, Maryland, where they were active in community programs, gardened, and traveled. On Saturday, March 10, 2018, quite suddenly and unexpectedly, he passed away at his home of an apparent heart attack. His legacy of outstanding work and good deeds lives on, as do our memories of him and our appreciation for his positive influence on our lives. He was truly "an officer and a gentleman."

Roscoe Randell, PhD 1970 [https://www.news-gazette.com/obituaries/roscoe-randell/article_39558750-dcfe-11e9-80d2-5cb9017b9fe4.html]

PARKER, Colo. — Raymond Roscoe Randell, known to all as Roscoe, returned home to be with his savior Sunday, Sept. 15, 2019. He was 89 years old. Formerly an Urbana resident for more than 50 years and a retired University of Illinois professor of Extension Entomology, Roscoe left this world peacefully in Parker, Colo.

Born March 11, 1930, on the family farm in rural Tuscola, Roscoe was the son of James L. and Florence E. (Peithman) Randell and the brother of Warren Randell, Francis Randell, Robert Glenn Randell, Howard Randell and Mary (Randell) Curtis. All of them preceded him in death.

Roscoe graduated from Tuscola Community High School in 1947 and from the University of Illinois at Urbana-Champaign with a B.S. in agriculture in May 1951. While an undergrad and in the year after, he was a member of the U.S. National Guard. Roscoe was called to active duty in early 1952 and was deployed to Korea that fall. He saw extensive combat as a U.S. army sergeant in a reconnaissance unit during the Korean War. He was honorably discharged in 1954 at Camp Carson, Colo.

Mr. Randell then resumed his studies at the University of Illinois, receiving his M.S. in agriculture in 1956. It was while there that he met the love of his life, the former Marjorie Doehring. They married in June 1956 and were married for over 60 years. Marjorie Randell passed in March 2017.

From 1956 to 1965, Roscoe Randell worked as a county farm adviser in Calhoun and Jersey counties in southwestern Illinois. He returned to Urbana as an assistant professor of entomology in 1965. In 1970, Roscoe completed the University of Illinois “trifecta” when his Ph.D. was conferred upon him.

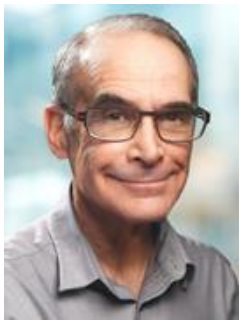
Dr. Randell specialized in research and recommendations for controlling pests which afflicted the state’s fruit and vegetable crops. He was also a turfgrass expert and worked with, and advised, many of the state’s golf courses. He retired in 1992.

Dr. Randell is survived by three children, Lorraine A. Kordik of Villa Park, Steven L. Randell (Jenny) of Castle Pines, Colo., and Linda S. Dean (Val) of Franktown, Colo.; seven grandchildren, Daniel, Lindsay, Ashley, Caitlin, Matthew, Adeline and Magnolia; two great-granddaughters, Katharine and Natalie; as well as countless friends, former colleagues and acquaintances.

Roscoe was fiercely loyal, particularly to his family. He loved his country, the University of Illinois, Fighting Illini sports, the St. Louis Cardinals, gardening, par-three golf and lawn and landscape maintenance. He had been an active member of the Urbana Exchange Club and volunteered for many years at Carle Foundation Hospital. He was a longtime member of Grace Lutheran Church in Champaign. And while Roscoe moved to Colorado for his final years, he never “forgot where he came from.” Following his retirement from the U of I, he could at times be found on that same family farm outside of Tuscola assisting in planting or harvesting. From his birth in Douglas County to his passing in Douglas County, Colo., he lived a very full and happy life.

A celebration of life is presently being planned for October in Champaign-Urbana. Once finalized, the family will do their best to announce and contact those interested in attending.

Daniel A. Strickman, MS 1976, PhD 1978, ESA Fellow (2016) [https://www.entsoc.org/fellows/strickman]



Dr. Daniel A. Strickman (1953-2020), senior project officer at the Bill & Melinda Gates Foundation, was elected as Fellow in 2016. A medical entomologist by training, he had the pleasure of experiencing entomology from basic research to practical application.

Strickman was born in San Diego, California, in 1953. His interest in entomology began with an insect collection in eighth grade. After attending Dartmouth College from 1971–1973, he transferred to the University of California, Riverside, in order to take an entomology course, but ended up staying until graduation with a B.A. in biology in 1974. Proceeding to graduate school at the University of Illinois at Urbana-Champaign, he studied floodwater mosquitoes with Dr. William Horsfall, receiving his master's degree in 1976 and his doctorate in 1978.

Dr. Strickman's first job was in the Peace Corps serving as a professor at the National University of Asunción, Paraguay. From there he served in the U.S. Air Force as a captain and consultant entomologist at the Occupational and Environmental Health Laboratory, Brooks AFB, Texas. Transferring to the Army in 1984, he worked for the Walter Reed Army Institute of Research in a series of research and administrative assignments, including work on mosquito taxonomy, scrub typhus, dengue, malaria, and repellent development, and served as chief of the Department of Entomology, and associate director.

During his 22-year military career, Dr. Strickman had three deployments, to Honduras, Korea, and the Middle East. As a colonel, he served as a consultant to the Surgeon General. He retired from the Army in 2003 and worked for three years as an entomologist at the Santa Clara County (California) Vector Control District, then eight years as national program leader and director of overseas laboratories for the Agricultural Research Service of the U.S. Department of Agriculture, and finally to his position at the Gates Foundation in 2014.

By 2016, Strickman had published 110 peer-reviewed papers, 12 book chapters, two co-edited books on repellents, and one co-authored book on personal protection from biting and stinging arthropods. His accomplishments were team efforts, which led to characterization of larval mosquito movement; discovery of drug-tolerant scrub typhus; elimination of *Aedes aegypti* from a series of Thai villages and elimination of *Aedes albopictus* from San José, California; the lowest rate of disease in any U.S. conflict during the first six months of Operation Enduring Freedom; and the formation of the Foundation for the Study of Invasive Species in Buenos Aires. He served as subject editor for the *Journal of Medical Entomology* from 2006 to 2010.

Strickman received the Dow AgroSciences 2014 Integrated Pest Management Team Award, a Bronze Medal in 2011 from the U.S. Environmental Protection Agency, the 2010 John N. Belkin Award from the American Mosquito Control Association, and the 2010 GreenGov Award from the Office of the President. His highest military medals were the Legion of Merit in 2005 and the Bronze Star in 2002.

Married to his wife, Linda, for over 40 years, they were the parents of three daughters and had one grandson as of 2016. Strickman passed away October 28, 2020.

PAMCA's statement on the passing of Dan Strickman [https://pamca.org/celebrating-dan-strickman-2/]
It is with great sorrow that we share the news that Dan Strickman passed away last week after a battle with cancer. Dan will be remembered as a true friend to us at PAMCA [Pan-African Mosquito Control Association] with a passion for public health and entomological science. He was well known, respected, and loved by many. We will remember him as a key ally to our effort to establish women in the vector control program [and] for strengthening the involvement of women in vector control. We will miss his brilliant ideas and suggestions. His wonderfully unique balance of humility and motivation in his interactions with us all will forever be cherished. We are grateful to him for inspiring so many of us and for trusting and believing in the young talents as being the future of Vector Control globally and particularly on the African continent.

Gilbert P. Waldbauer (1928-2020) [https://legcy.co/38hhsZV] Gilbert Peter Waldbauer was born on Wednesday, April 18, 1928 and passed away on Thursday, March 26, 2020. Gilbert Peter Waldbauer was a resident of Florida at the time of passing.

[University of Illinois Archives: https://archon.library.illinois.edu/?p=creators/creator&id=3033] Gilbert P. Waldbauer (1928-2020) served as Professor of Entomology (1960-1995) at the University of Illinois. He studied agricultural pests, pest management, mimicry, and insect mating but he also wrote books on biology and entomology for the general public. Throughout his career Professor Waldbauer worked internationally as a researcher and government consultant.

Gilbert P. Waldbauer was born on April 18, 1928, in Bridgeport, Connecticut. He served in the U.S. Army Honor Guard to General Douglas MacArthur from 1946 to 1947, and was stationed in Tokyo, Japan, during this time. Upon returning to the U.S., Waldbauer completed his Bachelor of Science degree in entomology in 1953 at the University of Massachusetts. He then earned his Master of Science and Ph.D. in entomology at the University of Illinois at Urbana-Champaign, in 1956 and 1960, respectively.

Waldbauer served as a professor of entomology (1960-1995). He toured the country speaking about natural history for the Massachusetts Conservation Council (1952-1953). He was an associate member of the Center of Zoonoses Research (1963-1964) and a research affiliate in entomology at the Illinois State Natural History Survey (1970). Internationally, he was a visiting scientist at the Instituto Colombiano Agropecuario in Palmira, Columbia (1971); a senior scientist at the International Rice Research Institute in the Philippines (1978-1979); and a USAID consultant to the Pakistan Agricultural Research Council in Islamabad, Pakistan (1985).

Professor Waldbauer was nationally and internationally recognized for his research into the adaptive significance of individual and group behavior among insects, including cecropia moths, bean leaf beetles, whiteflies, South American stink bugs, and corn earworms. During his career, Waldbauer authored and co-authored more than 100 academic articles. He also served as a reviewer for the National Science Foundation, and he was awarded grants from U.S. Department of Agriculture and the National Geographic Society for his research on agricultural pests and pest management.

Since his retirement, Waldbauer published several popular science books, including *Insects through the Seasons* (1996), *The Handy Bug Answer Book* (1998), *Birder's Bug Book* (1998), *Millions of Monarchs, Bunches of Beetles: How Bugs Find Strength in Numbers* (2000), *What Good are Bugs? Insects in the Web of Life* (2003), *Insights from Insects: What Bad Bugs Can Teach Us* (2005), *A Walk around the Pond: Insects in and over the Water* (2006), and *How Not to Be Eaten* (2012).

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A heartfelt and emphatic “Thank you!!” to our alumni supporters and friends—we really appreciate your generosity!

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*The Fred H. Schmidt summer award, endowed by his niece and nephew, Margaret and Ed Larsen, commemorates alumnus Fred H. Schmidt, who received a BS degree in 1957 and a master’s degree in entomology here in 1959.

**William H. and Jantorn B. Rufener Endowment Fund for Entomology was established to support students and educational programs in the Department of Entomology.

***Donation to name the Entomology Collections Room in the newly renovated Natural History Building after his father, Dr. Herbert Holdsworth Ross.

(If you gave a donation to the Department of Entomology from 1/1/2019-12/31/2020 and your name is not listed here, please forgive us. Every effort was made to try to obtain a complete list. If you contact us, we will be sure to include your name in the next issue.)

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Please attach photos!

https://www-s.life.illinois.edu/entomology/alumni/new

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